

THE IRON AGE

THURSDAY, FEBRUARY 26, 1891.

Circular Milling Machine.

THE PRATT & WHITNEY COMPANY of Hartford, Conn., have just placed on the market a circular milling machine possessing many new and admirable features. The machine is adapted for either inside milling or exterior circular milling. One aim which the builders had before them in the designing of this machine was to insure absolute rigidity and to avoid lost motion in the driving mechanism. This they have succeeded in doing, and have produced a machine that will find a wide acceptance. The spindle carrying the milling cutter is unusually heavy even for milling machines, and is mounted in bearings formed in pedestal projecting from a plate sliding on the bed plate of the machine. The machine is driven by a gear at one end, meshing with a pinion on the shaft carrying the cone pulley. At the other end of the machine is the chuck carrying the work, which is so mounted

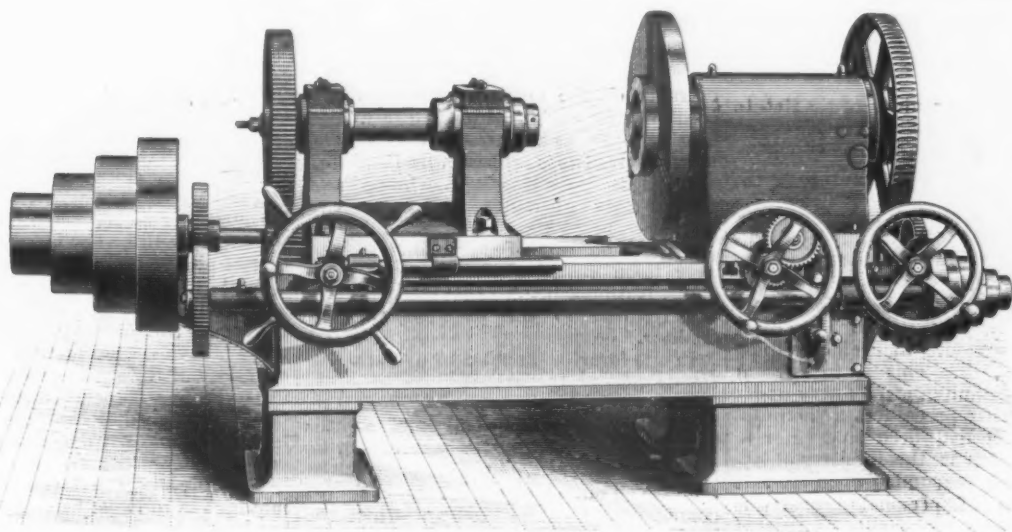
new one and only recently placed on the market, it has been thoroughly tested in the Pratt & Whitney works, to the satisfaction of the builders.

Shipbuilding in New England.

The Bangor *Industrial Journal* publishes a special edition containing a summary of the shipbuilding industry in New England. It shows that during 1890 there were launched from the shipyards of the New England States and Maritime Provinces 313 vessels, aggregating 132,015.35 net tons. These, classified by rig, are as follows: Seven ships, 11 barks, 24 barkentines, 10 hermaphrodite brigs, 200 schooners, 30 sloops, 21 steamers and 10 barges. Of this large fleet New England contributed 207 vessels, aggregating 99,842.35 tons and the Maritime Provinces 106 vessels of 32,173 tons. Of the New England contribution Maine leads with 125 vessels

and big fore-and-afters seem to be as popular as ever. An estimate of the vessels now on the stocks or under contract in Maine shipyards accounts for between 40,000 and 50,000 tons, and it is thus evident that the coming season will not be as quiet in shipbuilding circles as has been predicted.

Canadian Progress.—Sir Charles Tupper, the envoy from England who is expected to pilot Canada through her troubles and who will especially see that she maintains her loyalty to the crown, grows eloquent in describing her resources and that she is fast rising in the estimation of people in the United States. In an address delivered at Halifax he says: "Five millions of Canadian people had achieved greater results in pushing their transcontinental road than 40,000,000 to the south of them had with theirs. Canada was scarcely noticed or thought of in the United States a few years ago; now you



CIRCULAR MILLING MACHINE, BUILT BY THE PRATT & WHITNEY COMPANY.

as to move in a bed placed at right angles to the machine bed, so that work of any desired diameter may be milled either inside or outside. The spindle carrying the face plate is provided at its opposite end with a worm wheel engaging with a worm driven from the gear shaft through gearing, as shown, change gears being provided for different speeds. Provision is made for moving this table by the hand wheel shown.

It is possible with this machine by means of an π shaped cutter to mill the face and both edges of the gear, the work done possessing most decided advantages over that done in the usual way in the lathe, since it is done at least five times as fast and much more accurately. So nicely are the gears cut and so rigid is the machine that it is possible to do the best work with the milling cutter running in such a direction as to cut into the scale instead of cutting down and lifting the scale. In circular work it is evident that not only ordinary inside circular work can be easily done, but also after a certain circular opening has been cut it is possible to cut recesses in the bottom of this opening by introducing the cutter through the opening formed and then bringing it to bear at the desired point on the bottom of the opening. Although the machine is a

of 74,465.87 tons. Massachusetts comes next with 54 vessels of 13,603.49 tons, and Connecticut follows with 82 vessels of 11,772.79 tons. In the Maritime Provinces Nova Scotia leads with 64 vessels of 23,779 tons, New Brunswick follows with 36 vessels of 6667 tons, and then comes Prince Edward Island with 6 vessels of 1729 tons. Of this grand total, Maine has contributed about two-fifths in number of vessels and about three-fifths in tonnage. The record of 74,467 tons is a very material increase over the past few years, and only twice in the past decade, 1882 and 1883, has it been surpassed, and then only in a very slight degree, the record of those years being 76,055 and 74,708 tons. Of the Maine fleet the most notable is the magnificent ship Shenandoah, which registers 3406.78 tons gross, and 3258.58 net, and is the largest wooden ship afloat. Also of colossal proportions, surpassed only by the Shenandoah, is the Rappahannock, registering 3053 tons net. The Parthea, 2371 tons; the St. Mary's, 1943 tons, and the L. D. Carleton, 1788 tons, were among the finest clipper ships that ever left Maine stocks. The entire tonnage for the year in Maine represents an expenditure of about \$4,000,000. Schooners continue to largely predominate among the vessels built in Maine yards,

find the envious eyes of the people and the press attracted toward it, and a Senate committee taking testimony on its trade with that country from San Francisco to Boston. All this meant that we had assumed a place among the nations of the world."

Pickands, Brown & Co., 1009 Rookery Building, Chicago, have issued an attractive brochure intitled "Chicago Pig Iron." It is printed on cardboard, and the leaves are bound together with blue silk ribbon. In it the special qualities of the pig iron produced at the Illinois Steel Company's furnaces are set forth. The various grades enumerated are Bay View, suitable for general work; Milwaukee Scotch, a standard softener; Gertrude, an ordinary softener; Union Bessemer, for best machinery work; Standard Bessemer, for all kinds of Bessemer and open-hearth work.

At a meeting of the Buena Vista Company, Buena Vista, Va., the president, A. T. Barclay, reported that the receipts, including \$72,565.12 stock subscriptions and \$329,347.24 for town lots, were \$583,980.92. The disbursements were \$393,849.76, including \$238,617.02 for subscriptions to different enterprises.

The Statute of Frauds.*

The statute of frauds, as it is known to the legal world, is a force in the commercial world which is very often felt by the business man, but which is evidently very generally misunderstood, or not understood at all, by men whose affairs are directly affected by its operation. In the first place it is the provision of the statute of frauds regarding contracts which must be in writing which often occasions trouble. Under the provisions of this statute, which is in force in nearly if not quite all the States, a contract which by its terms is not to be performed within one year must be in writing. But in order to make this provision effective, it must definitely appear from the terms of the contract itself that it is not to be performed within a year. There are many contracts which in fact are not to be performed within a year which are not within the statute of frauds, because, by the terms as agreed upon by the parties, they might be performed within a year. A contract which is entered into at a specified date, to take effect at a future date, is not within the statute if between the time it is to be entered upon and the time of its termination a year does not elapse, although the time of the termination of the contract is more than a year from the time it was actually entered into. It is the period of performance that determines whether or not it is within the statute.

A very important provision of the statute of frauds, in its practical bearing upon commercial transactions, is that which requires that every sale of personal property of the value of more than a specified sum, in some States \$50 and in others \$100, which is not evidenced by written instrument properly spread upon the public records must, in order to be valid as against the creditors of the seller, be accompanied by an actual and immediate change of possession, which change must continue unbroken. This is to prevent debtors from claiming, after a levy under execution or other process, that the property levied upon had been sold prior to the levy, and then is the property of another. The law is founded upon the rule that possession of personal property is *prima facie* evidence of title, and that change of possession passes title presumptively. In the absence of notice or actual knowledge to the contrary, a man has a right to presume that personal property which he finds in the possession of another belongs to the one who has it in his possession. A proper instrument placed on file in the place provided by law is constructive notice to all of the rights of others, but the law requires either this or actual possession.

Another important provision of the statute of frauds is that relating to contracts of guarantee. It is a fundamental principle of the law of contracts that in order to be subject to enforcement in the courts of law it is necessary for a contract to rest upon a valid consideration. And so it is provided by the statute of frauds that every promise to become responsible for the debts of another must rest upon a consideration sufficient to sustain it as a separate contract. A consideration in law is the receipt of some substantial benefit, or the parting with some right or property of value. This consideration must pass between the one who seeks to enforce the agreement and he whom he seeks to enforce it against, subject, of course, to the rules of assignment of rights. One of the most common forms of this contract in business is that by which one person takes another to a merchant and guarantees that payment by the latter for any goods he may purchase. It very frequently happens that

when the merchant is driven to the guarantee as a last resort for his money, he finds that the statute of frauds stands as a bar to the enforcement of what he supposed was a perfect contract. If Jones goes with Smith into the store of Brown and says to Brown "Let Smith have what goods he wants and I will see that you are paid," the agreement is one which cannot be enforced against Jones, because the merchant relied upon the credit of Smith to some extent at least, and the law will not attempt to analyze the extent to which Brown relied upon Smith and the extent to which he relied upon Jones. But if Jones says directly and squarely "Let Smith have what goods he wants, and if he does not pay for them I will," that is a contract which is not within the statute, for it will be presumed that the merchant would not have parted with his goods except upon the agreement of Jones to pay for them. In order to make a valid contract of guarantee at the time the goods are sold, it must be an absolute agreement to pay for them, and if made at the time the goods are sold, the fact that the goods are parted with is a sufficient consideration. It is quite a different matter if the guarantee is made after the goods have been sold. Then it is necessary that there should be a separate consideration. The extension of a further credit to the original debtor upon the agreement of another guaranteeing both the new and the old credit will be sustained, and the forbearance of the creditor from legal proceedings against the debtor will be a good consideration for a contract of guarantee, but it must always appear that the thing claimed as a consideration was induced solely by the guarantee, and that no reliance was placed elsewhere, for if in the consideration there be any taint of reliance upon anything else than the guarantee, it cannot be said that the guarantee has resulted to the prejudice of the creditor.

In one form or another the statute of frauds affects the transactions of every business day, and it is impossible in a review of its provisions so brief as this necessarily is to give it anything like adequate treatment, but these suggestions are thrown out as being among the most common and ordinary points at which the business man comes in contact with the statute, and at most these suggestions can only be safeguards on the points suggested. It is a maxim of the law that "Abundant caution does no harm," and it is in line with the spirit of this maxim that these suggestions are made.

For the first time to our knowledge figures have been gathered to give some conception of the quantity of pig iron which is carried direct, in a molten condition, to the Bessemer converters in this country. John Birkinbine, in a lecture before the Franklin Institute at Philadelphia, recently delivered, states that an inquiry shows that the amount of direct metal converted last year was 620,000 tons. One large direct-metal plant was not in operation last year, since it was undergoing remodeling, while another plant began operations of this kind only two months before the close of the year.

Two weeks ago the city of Philadelphia received proposals for a new pumping engine, having a capacity of 20,000,000 gallons a day, to be located at the Spring Garden Water Works. Four bids were received, the lowest being that of the Southwark Foundry and Machine Company, who offered to furnish the pumping engine for \$72,500, to be placed in position in nine months' time from the date of awarding the contract. The other bidders were the Holly Mfg. Company of Lockport, N. Y., the I. P. Morris Company and the Worthington Engine Com-

pany. At the time the proposals were opened there was some doubt expressed as to the facilities of the Southwark Company for supplying the pump. Mayor Fitler, Director Wagner and Chief Ogden of the Water Bureau, visited the establishment for the purpose of satisfying themselves. The officials were met by representatives of the company, and after being conducted throughout the entire works, returned to the City Hall and awarded the contract to the Southwark Company.

WRIGHT'S REPORT.

The Commissioner of Labor on the Cost of Production of Iron and Steel.

We referred editorially last week to the report of Hon. Carroll D. Wright, commissioner of labor. We have since received an official abstract of the report in question, which we print below. To what extent the generalizations are warranted by the detailed facts we have no present means of judging. The trade will receive the conclusions with reserve.

The cost of production of iron and steel and steel rails is the subject of a report which Col. Carroll D. Wright, commissioner of labor, transmitted to Congress through the President on Saturday. This report is the result of several years of careful investigation in this country and Europe, based upon an examination of the books of leading manufacturers and inquiries by expert special agents of the Department of Labor. The inquiry was directed by the act establishing the department, with a view to ascertaining the cost of producing articles dutiable in the United States in leading countries where such articles are produced, by units of production, in order to show the differences in cost of production between this country and Europe and the possible bearing of these differences upon tariff rates. Colonel Wright has carefully refrained in his report from any discussion of the tariff or any other controverted question. He has simply presented the results of his inquiries as to facts, leaving inferences to be drawn by persons who study the report.

The report covers three features, the first relating to the cost of production of the articles selected, the second relating to the rates of wages, time, earnings and efficiency of the labor employed, and the third relating to the cost of living and total earnings and expenditures of the men employed. The facts regarding wages and efficiency of labor were obtained from the pay accounts of the establishments; those relating to the cost of living and expenditures were obtained from the men themselves.

Colonel Wright intends to deal in future reports with the great textile industries. He has confined himself in the present report to iron, steel, coal, coke, limestone and ore. The first part of the report deals with

THE COST OF PRODUCTION.

In arriving at this, all of the expense for interest, insurance, depreciation of the value of plant and royalty to the owners of the soil have been excluded, as have also charges for freight of product to place of free delivery. The facts upon these points have been collected and are given more or less fully for those who wish to use them, but they are not included in the leading tables. Colonel Wright has proceeded upon the assumption that if these elements were readily determinable with precision they would usually offset each other and not alter the results of comparisons from which they are

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omitted. The essential elements of cost which are included are the cost of materials, the labor, the salaries of officials and clerks, supplies and repairs and taxes. The labor which enters into the raw materials is not classified as such in estimating the labor cost of a given article, but as a part of the cost of the materials. The labor which enters into the production of the materials is treated of in another part of the report.

In spite of some opposition from the manufacturers to open their books and disclose their methods, Colonel Wright was able to obtain the facts from 618 establishments manufacturing various kinds of iron and steel or its more finished products. This is about 200 more establishments than were covered in the brief preliminary report which he made public last summer. The facts regarding pig iron are given at greatest length, because they were obtained for a larger number of establishments, and investigation yields more precise results than with more advanced products. Figures of 118 establishments manufacturing pig iron are given, of which about two-thirds are in the United States. The following table will show the comparative

COST OF MANUFACTURING PIG IRON

in different establishments in this country and Europe. The words "Northern" and "Southern" apply to the two districts into which Colonel Wright has divided the iron works of this country. The salaries paid to officials and clerks, the cost of supplies and repairs and the payments for taxes cannot be given separately here, but are included in the total cost. Each line represents the work of a separate establishment, and of the 118 given in the report those are quoted here which fairly represent the highest, lowest and average rates of cost of materials, labor cost and total cost in each locality.

The Cost of Manufacturing Pig Iron.

Locality.	Cost of material.	Labor.	Total cost.
Northern.....	\$17.728	\$3.589	\$23.165
Northern.....	13.223	1.194	15.202
Southern.....	7.757	1.461	10.279
Northern.....	11.991	.975	13.584
Northern.....	11.663	1.364	13.433
Europe.....	9.559	.418	10.394
Europe.....	12.228	.912	13.434
Great Britain.....	9.230	.601	10.290
Great Britain.....	9.308	.743	10.729
Europe.....	14.219	.719	15.075
Europe.....	6.785	.470	7.736
Northern.....	12.267	2.135	15.258
Great Britain.....	6.454	.618	7.677
Northern.....	11.147	1.166	12.820
Southern.....	7.173	1.816	9.634
Southern.....	7.202	2.608	10.267
Southern.....	8.877	1.218	10.822
Southern.....	8.164	.595	9.623
Europe.....	9.885	1.414	12.070
Great Britain.....	9.529	.769	10.893
Europe.....	9.061	.711	11.107
Europe.....	7.327	.755	8.765

A comparison of the cost of materials used in the Northern and Southern districts of the United States shows that the difference in favor of the South in the cost of ore and of coal is very great, although the difference, so far as the ore is concerned, is partially offset by its comparatively higher per cent. of iron in the northern district. The ore used in the northern district costs per ton an average of \$4.401; the cinder, scrap, &c., \$2.631; the limestone, 79.8 cents; the coke, \$3.014, and the coal, \$2.695. The cost in the southern district for the ore is \$1.513; the cinder, scrap, &c., \$1.031; the limestone, 70.1 cents; the coke, \$3.084, and the coal, \$1.566.

The following table illustrates in gross the comparative cost of different items in

the northern and southern districts of the United States:

Summary of Cost of all Elements in Making Pig Iron.

Items (per gross ton).	Northern district.	Southern district.
Establishments reporting the facts required for the statements below...	26	24
Cost of all materials used in these establishments.	\$6,387,622	\$5,450,459
Cost of labor, &c., in these establishments...	1,199,918	1,515,995
Cost of all elements in these establishments...	7,587,540	6,966,454
Tons of product in these establishments.....	544,377	647,728
Average cost of all materials per ton of product in these establishments.....	\$11,734	8,414
Average cost of labor, &c., per ton of product in these establishments.....	2,204	2,341
Average cost of all elements per ton of product in these establishments.....	13,938	10,755

Colonel Wright makes a careful effort to ascertain

THE ENTIRE LABOR COST OF PIG IRON,

the cost of each of the raw materials, as well as of working up the raw materials in the foundry. He says that if a complete analysis of such cost were possible, the result would show the whole chargeable to labor. Yet if the inquiry is limited to discovering what was paid directly for labor at each successive stage, and what for other important items, which in an ultimate analysis would be resolvable into labor, the result may throw some light on the comparative cost of production in different localities. He accordingly presents tables in which the larger portion of the cost of pig iron is assigned to labor, and the smaller portion for the salaries of officials and clerks, supplies, repairs, taxes and transportation. The aggregate of these items shows a difference from the total cost of production, which may be ascribed to profit and royalties at different stages of the process of converting the ore in the ground into the finished pig-iron product. The following table shows the results of this analysis in regard to 13 establishments in the United States and Great Britain:

Total Cost of 1 Ton of Pig Iron, From the Mining of the Materials to the Finished Product Inclusive.

Kind of iron.	Direct labor.	Officials and clerks.	Supplies, repairs and taxes.	Transport to point where used.	Difference between foregoing actual costs and costs as charged by blast furnaces.	Total.
Northern District, U. S.:						
Bessemer.....	\$9.446	\$0.175	\$1.552	\$1.697	\$1.101	\$13.971
Bessemer.....	4.412	.220	1.350	5.316	3.922	15.281
Bessemer.....	5.733	.510	2.108	4.992	3.134	16.503
Bessemer.....	5.569	.327	1.493	5.322	1.790	14.518
Bessemer.....	5.274	.398	1.389	3.543	5.063	15.823
Foundry.....	3.701	.....	.....	6.040	3.944	13.685
Hot-blast charcoal.....	6.737	.....	.....	6.311	3.159	16.207
Southern District, U. S.:						
Run of furnace.....	7.293	.191	.667	.779	1.003	9.933
Run of furnace.....	5.884	.285	1.220	1.270	.502	9.161
Run of furnace.....	4.312	.453	1.232	1.555	2.071	9.623
Run of furnace.....	7.598	.269	1.181	.360	.219	9.634
Run of furnace.....	6.958	.351	1.292	1.180	.819	10.610
Great Britain:						
Bessemer.....	3.329	.148	1.543	3.237	1.739	10.216

This table shows the labor required to produce in each case 1 ton of pig iron. This involves, of course, the conversion of much more than 1 ton of ore and the transportation of more than 1 ton. The actual labor cost of mining and converting the ore is charged as reported by the different

establishments, although some mine their own ore and others purchase it and pay a profit, which is partly disclosed in the difference between the elements of cost and the total cost given.

Important facts are given regarding the production of muck bar iron, finished bar iron, miscellaneous iron, steel ingots, steel rails, bituminous coal, coke, iron ore and limestone. The facts obtained by Colonel Wright in reference to

STEEL RAILS

do not represent so wide a distribution of factories, but very complete information was obtained from 13 representative establishments in this country and Great Britain. The proprietors of several other establishments furnished important analytical information or positive statements as to the cost of making steel rails. The other steel-rail manufacturers showed a sensitiveness about giving information which did not appear in any such degree among the manufacturers of pig iron. The following table shows the results of inquiries as to the cost of producing steel rails, the expenses for officials and clerks, fuel, repairs and taxes not being given separately, but, as in the case of pig iron, included in the total:

The Cost of the Production of Steel Rails.

Nos.	Locality.	Net cost of materials.	Labor.	Total cost.
1	United States.....	\$21.109	\$1.540	\$24.799
2	United States.....	25.114	1.382	27.687
3	Continent of Europe	17.672	1.043	19.576
4	Continent of Europe	18.066	2.519	22.184
5	Continent of Europe	18.066	4.641	25.652
6	Continent of Europe	18.231	2.583	23.121
7	Continent of Europe	18.103	2.689	23.190
8	Continent of Europe	18.664	2.974	23.743
9	Continent of Europe	18.808	1.028	22.439
10	Continent of Europe	19.880	2.160	26.711
11	Great Britain.....	18.058	2.548	21.907
12	Great Britain.....	16.395	1.368	18.588
13	Great Britain.....	17.159	1.583	20.178

Colonel Wright states that

THE LABOR COST OF STEEL RAILS,

speaking of labor cost after all the materials have been assembled and are ready to be subjected to the proper manipulations for the production of rails, should be less per ton relatively in this country

than in Great Britain or on the Continent of Europe, because American producers of rails dispense with at least one expensive process still adhered to by many foreign producers, and materials in the United States are purer than those used in most other countries. Hence the quantity of

ore required for the production of a ton of rails is less in this country than in many places abroad, and the labor required to handle the materials in a way to produce a ton is less. This is shown by the quantities of ore used in different establishments. In an establishment given in the northern district of the United States 4137 pounds of iron ore were necessary for the production of 1 ton of standard rails, while in an establishment in Great Britain 5127 pounds of iron ore were necessary for the production of 1 ton of practically the same kind of rails, while on the Continent of Europe 5701 pounds of ore were necessary for the production of 1 ton of rails. These are the establishments numbered 1, 12 and 3 in the last Table, and are, Colonel Wright says, far more indicative of the true conditions surrounding the production of rails in the respective countries than any of the others given. The entire direct labor cost of production in these three establishments was \$11.59 for the United States, \$7.81 for Great Britain and \$8.10 for the Continent of Europe, showing a difference as against the United States of \$3.78 in favor of Great Britain and \$3.49 in favor of the Continent of Europe.

The section of the report relating to

FREIGHTS

has an important bearing upon the question of charges at different points, and shows that the difference in cost of delivery at distant points often exceeds the protection afforded by the tariff. In some cases the heavy freight charge for transporting iron and steel rails benefits American manufacturers; in others it places them at a serious disadvantage at ports where there is water competition with European manufacturers. As an illustration of the practical working of freight rates with reference to steel rails, the report quotes the statement of the manager of one of the largest steel companies in the United States. He said that the difference in cost of production of steel rails in Chicago, for instance, and in England, would not exceed \$3.50 or \$4 per ton, and that the freight rate (\$5 per ton) from Chicago to New York offered a large protection to his company. This manager also prepared the following statement showing the cost of transportation of steel rails per gross ton from New York to San Francisco by water:

Lighterage.....	\$0.50
Insurance.....	.45
Three months' interest.....	.45
Freight by water.....	10.00
Total.....	\$11.40

The total expenses then of transportation from New York to San Francisco is \$11.40, as against \$17.92 per ton from Chicago to San Francisco, and it has, as the same manager states, always been cheaper to ship rails from Chicago to New York, rate \$5 per ton, and then ship them from there to San Francisco than to ship them directly from Chicago to San Francisco, or in other words, that it is cheaper to ship from Chicago to San Francisco via New York than it is to ship direct. The same gentleman also prepared the following statements, based upon market values of rails in November or December, 1890:

Price of English rails, per ton, without tariff:	
At Liverpool.....	\$25.00
At New York.....	25.00
At Chicago.....	30.00
At San Francisco.....	25.00
Price of English rails, per ton, with tariff:	
At Liverpool.....	\$25.00
At New York.....	39.00
At Chicago.....	44.00
At San Francisco.....	39.00
Price of Chicago rails, per ton:	
At Chicago.....	\$30.00
At San Francisco.....	47.92

Giving English rails an advantage of \$6.92 over Chicago rails in the San Francisco market.

It was assumed by this manager, and he claimed to know, that during a greater part of the season ocean steamers and vessels transport rails as ballast and free of charge for freight, from Liverpool to New York or San Francisco. Others have often made this statement, and it is given here for what it is worth. If it is true the statements are of great importance.

The second part of the report deals with the time employed, and

EARNINGS AND EFFICIENCY OF WORKMEN engaged in production. The pay-rolls were copied in 99 representative establishments to show the length of period the establishment was in operation, the average daily earnings of employees, the number of employees, the total days of work done, the average time of each employee, the total earnings of all employees, the average earnings of each and the number of employees which would have been necessary to do the work if each had served through the year, and the average earnings of an employee who served through the year. These facts are presented for each establishment separately and for each class of employees. The following table shows in a summary way the results of these inquiries in regard to pig iron for certain establishments in the northern and southern sections of this country and in Europe. The time covered for all of the establishments in this country is one year but in the foreign establishments it is three months, so that in order to obtain the earnings of an employee, if employed continuously in the same position for a year, the figures given in the last column should be multiplied by four.

Earnings of Labor in the Production of Pig Iron.

Locality.	Average daily earnings.	Total earnings.	Average earnings.	Earnings if position was continuously filled by same person.
Northern district of the United States.....	\$2.03	\$52,238	\$169	\$735
Northern district of the United States.....	1.67½	75,519	149	592
Northern district of the United States.....	1.58½	42,371	192	574
Northern district of the United States.....	1.70	49,296	154	589
Northern district of the United States.....	1.53½	58,272	304	533
Northern district of the United States.....	1.47	31,593	277	520
Northern district of the United States.....	1.62	40,029	288	569
Southern district of the United States.....	1.34	44,327	76	490
Southern district of the United States.....	1.23	44,956	98	426
Southern district of the United States.....	1.22	15,173	131	422
Continent of Europe (three months).....	.70	1,895	53	63
Continent of Europe (three months).....	.64	5,478	50	58
Great Britain (three months).....	.67	7,761	52	59
Great Britain (three months).....	.62	12,795	49	55

The discussion of

THE EFFICIENCY OF LABOR

is one of the most important and novel features of the report. The term "efficiency of labor" is defined by Colonel Wright as but another expression for cost of producing a unit, like a ton of pig iron, in labor consumption—that is, the time cost of production. To reduce the mass of figures obtained with accuracy to these simple units required an almost infinite amount of labor. The imperfections and lack of uniformity in the terms used for occupations on the various pay rolls, the irregular intervals of operation and stoppage of establishments and the varying character of the product upon which they worked, all caused differences which had to be carefully considered in calculating the labor units.

The points upon which inquiry was made of the different establishments were:

1. A statement of the daily hours of labor in each occupation.
2. A statement of the average number of workmen in each occupation through the period.
3. A statement of the rate of pay (when all work at one rate), or the average rate of pay (when they work at different rates), of those paid by the hour, day or week in each occupation through the period.
4. A statement of the average earnings per week, at full time, of those paid by the quantity.

The department had, in addition to these statements, the total tons of product and the total wages paid during the period, which had been taken from the books of the firms.

The process of handling this data to determine efficiency was as follows: The wages of the entire force for a single week was first computed, which was then divided by the number of hours of work done, giving the average wages per workman per hour. This was divided by the labor cost per ton, as previously worked out for the tables on cost of production, the quotient, of course, being the desired result—average tons of product per man per hour. These tables disclose a wide range of difference in efficiency, and, so far as individual occupations are concerned, this wide range of efficiency cannot in any apparent degree be attributed to high or low wages. The difference appears to be due to the manner of applying labor to accomplish given ends, some establishments applying it most economically and others with more or less waste. It is likely, Colonel Wright says, as a general feature, that in establishments where high wages are paid the appliances of production are of the best, and from this that high wages and high efficiency would usually go together. A comparison of the figures shows that in pig iron in the northern district of the United States 43 of the 45 establishments have an efficiency of 0.08 or a ton or more, one ranging as high as 0.16 and under 0.17; 34 being concentrated in the four groups that begin with 0.08 and end under 0.12, while in the southern district of the United States 14 of the 21 have an efficiency under 0.08, and of these seven above this figure, five are under 0.10. In the northern district for those of 0.08 and above the average earnings per man per hour range from 0.14½ to 0.18½, increasing quite generally with the increase of efficiency, while those below 0.08 have earnings from 0.11½ to 0.12½. In Great Britain three establishments are given, two of which have a high efficiency, both being between 0.12 and 0.14 tons, and accompanied by earnings of 0.09 and 0.10, while the remaining one, with an efficiency between 0.07 and 0.08 tons, has earnings of but 0.05½. The five establishments for the Continent of Europe have an efficiency rather lower than the northern district of the United

States, agreeing more nearly with the southern. No connection between efficiency and earnings is traceable in them. In steel rails the difference in efficiency is very marked. The two establishments for the United States having an efficiency equal to between 0.12 and 0.13 tons of product per man per hour and the five for the foreign countries all fall under 0.06 tons, ranging down even to under 0.02 tons.

The following table shows in an interesting manner the relative cost of producing a ton of pig iron in money and in working hours in different establishments in the northern and southern districts of the United States:

The Labor Cost of Pig Iron.

Locality.	Total product in tons.	Money cost per ton.	Time cost per ton in hours.
Northern.....	8,296	\$2.069	16.11
Northern.....	29,390	1.983	14.41
Northern.....	32,633	1.268	8.92
Northern.....	2,447	1.990	14.76
Southern.....	34,506	1.359	11.34
Southern.....	32,921	1.476	13.49
Southern.....	11,855	1.311	12.89

Comparisons of this character could not be made for European establishments, but the average earnings per man per hour and the average product per man per hour in tons have been furnished for many establishments. A few of these figures in reference to pig iron in the northern and southern districts of the United States, in Europe and in Great Britain are given in the following table:

Average Earnings and Product of Pig Iron.

Locality.	Average earnings per hour.	Average product per hour in tons.
Northern.....	\$0.143	0.094
Northern.....	0.134	0.085
Northern.....	0.187	0.162
Northern.....	0.095	0.067
Northern.....	0.140	0.081
Northern.....	0.163	0.091
Southern.....	0.131	0.072
Southern.....	0.115	0.044
Southern.....	0.131	0.076
Southern.....	0.121	0.154
Europe.....	0.059	0.082
Europe.....	0.045	0.105
Europe.....	0.051	0.067
Great Britain.....	0.058	0.079
Great Britain.....	0.100	0.130

An interesting part of the report, which hardly permits condensation, is the closing one relating to the cost of living. The facts were gathered from the heads of families employed in the very establishments from which schedules relating to cost of production and pay accounts were obtained, but upon budgets uniform for all industries. These budgets comprehended the constitution of the family; facts as the occupation of the house, whether owned or hired, or furnished by the employer; the cost of living, in itemized accounts, and, wherever possible, with quantity and cost, with statements as to the yearly income of the members of the family, and the total cost of living in comparison with the total income. These facts were gathered from 3260 families, and present many suggestive facts. The entire report will make a volume of about 1200 pages.

Application has been made for a charter for the Ellwood Shafting and Tube Company. The new concern will be located at the new town of Ellwood, Pa., near Beaver Falls. This concern will succeed to the business of the Union Drawn Steel Company of Beaver Falls, Pa., whose

plant will be removed to Ellwood during the next two months. It is the purpose of the new concern to engage in the manufacture of drawn seamless tubes, in addition to the manufacture of drawn steel shafting. The production of steel tubes by drawing has never before been attempted in this country.

Grant Locomotive Works.

The plans for the grouping of the buildings of the Grant Locomotive Works at Chicago have been completed by the architects and adopted by the directors of that company. The works will be bounded on the north by Twelfth street, on the south by Sixteenth, and will front on Robinson avenue, the office occupying a position about midway between the extremities or about where Fourteenth street would be were it cut through. The plans were prepared by architects Raeder, Clafflin & Crocker. There will be 12 main or principal buildings, three of the more important being the office, machine shop and foundry, having extended frontages on Robinson avenue. The entire plant has been designed with a view to doubling the capacity just as soon as such a step may become necessary, the capacity of the buildings as they will now be constructed being 250 locomotives a year. For this reason the ends of the buildings will not be built of solid masonry, but will be of wood and corrugated iron that the cost will be lessened when the extensions are made. The office and storage building will be two stories high, with a frontage of 130 feet and a depth of about 50 feet. The office and a storage room will be in the first story, while the drafting room will occupy the second story.

The machine shop will be 370 feet long and 110 feet wide with walls 38 feet high. The erecting shop will be 225 feet long by 38 feet wide and 38 feet high and will be connected with the machine shop, making an L-shaped structure. The blacksmith shop will be 250 x 80 feet, 22 feet high, while the hammer shop will be 80 x 125 feet. There will also be a boiler and tank shop 100 x 250 feet, and a wood shop 70 x 230 feet. The main building of the foundry will be 260 feet long by 80 feet wide and will have several annexes, including a cooling room, cupola and brass foundry. The paint shop will be 170 x 70 feet and 20 feet high, while the pattern shop will be about 130 x 60 feet. A thorough system of railroad tracks, connected at both ends with the railroad, will traverse the grounds by means of the nine switches, containing in all about 10,000 feet of track. In the center of the plant will be a transfer table about 40 feet long running in a pit of about 250 feet in length which will connect the tracks with the principal shops. The buildings will be constructed of brick and will be supplied with traveling cranes and all modern equipment for the expeditious handling of material. The details of the plans are now being worked out and the work of construction will be commenced as soon as possible, it being the intention to have the buildings completed and ready for the equipment by July 1, the works to go into operation shortly after that time. The plant, with railroad tracks, will occupy about 33 acres of land.

The convention of the United Mine Workers in session at Columbus, Ohio, for some days, completed its work, and adjourned on the 17th inst. The following officers were elected: John B. Rae of Pennsylvania, president; P. H. Penna, Indiana, vice-president; Patrick McBride, Pennsylvania, secretary-treasurer; Executive Board, W. B. Wilson, Pennsylvania; John Nugent, Ohio; W. C. Webb, Kentucky, and John Kline, Indiana.

Steel and Rail Output.

PRODUCTION IN 1890.

The American Iron and Steel Association has received from the manufacturers complete statistics of the production of Bessemer-steel ingots and Bessemer-steel rails in the United States in 1890. These statistics show very large gains in the production of both ingots and rails in 1890 over 1889. Our production of Bessemer-steel ingots in 1890 was the largest in our history of this great industry.

The following table shows the production of Bessemer-steel ingots in the first half and second half of 1890, and the total production in 1890 compared with 1889. In the figures for the periods mentioned is included the production of ingots by the Clapp-Griffiths process, but we also add to the table a statement of the ingots produced by this process alone. The small production of steel by the Robert-Bessemer steel works of the country is also included in the totals:

Ingots.

States.	First half 1890.	Second half 1890.	Total 1890.	Total 1889.
	Net tons.	Net tons.	Net tons.	Net tons.
Pennsylvania..	1,275,616	1,239,808	2,515,424	1,973,544
Illinois.....	386,407	462,254	848,751	740,001
Ohio.....	394,088	201,267	595,355	331,238
Other States..	175,028	178,967	353,995	236,985
Total.....	2,041,239	2,082,296	4,123,535	3,281,829
Clapp-Griffiths only.....	30,627	37,363	79,990	82,850

In gross tons our production of Bessemer-steel ingots in 1890 was 3,681,728 tons, against 2,930,204 tons in 1889, an increase of 25 per cent.

The total production of Bessemer-steel ingots in 1890, as given in the above table, was not only the largest in our history, but it was very much the largest. In the following table is given the production of ingots in the last six years, by States:

Years.	Pennsylvania.	Illinois.	Other States.	Total.
	Net tons.	Net tons.	Net tons.	Net tons.
1885.....	1,109,089	366,659	226,064	1,701,762
1886.....	1,547,577	535,902	498,314	2,541,493
1887.....	1,752,445	877,513	673,399	3,288,357
1888.....	1,592,629	620,856	599,015	2,812,500
1889.....	1,973,545	740,001	598,283	3,281,829
1890.....	2,515,424	848,751	759,360	4,123,535

The following table shows the production of Bessemer-steel rails of all sizes, including street rails, in the United States in the first half and second half of 1890, and the total production in 1890 and 1889. In this statement we do not include a few thousand tons of Bessemer-steel rails which were rolled in iron rolling mills from purchased blooms:

Rails.

States.	First half 1890.	Second half 1890.	Total 1890.	Total 1889.
	Net tons.	Net tons.	Net tons.	Net tons.
Pennsylvania..	738,931	657,529	1,396,460	1,102,451
Illinois.....	279,441	308,906	588,347	522,054
Other States..	14,286	14,905	29,191	22,194
Totals.	1,032,658	980,340	2,013,198	1,646,699

In gross tons our production of Bessemer-steel rails by Bessemer steel works in

1890 was 1,797,498 tons, against 1,470,267 tons in 1889, an increase of 22 per cent.

Our total production of Bessemer-steel rails by Bessemer steel works and by iron rolling mills has been as follows in the five years preceding 1890, to which we add the production by Bessemer steel works alone for that year by States:

Years.	Pennsylvania.	Illinois.	Other States.	Total.
	Net tons.	Net tons.	Net tons.	Net tons.
1885.....	736,522	308,742	29,843	1,074,007
1886.....	1,111,171	430,975	221,621	1,763,667
1887.....	1,276,845	728,536	348,761	2,354,132
1888.....	930,146	488,639	133,852	1,552,631
1889.....	1,141,350	522,064	27,860	1,691,264
1890.....	1,396,480	587,537	29,191	2,013,188

The steadily increasing use of Bessemer steel in this country for purposes other than the manufacture of rails has frequently been referred to in our statistical statements, but this use was much more marked in 1890 than in any preceding year except 1889. In 1890 about one half of the Bessemer steel ingots we produced were converted into rails.

Treasury Decisions.

Among the recent decisions of the U. S. General Appraiser on a protest under an importation of flat wire, the articles in question were iron strips, varying from $\frac{1}{8}$ to $\frac{1}{4}$ inch in width, and from 25 to 27 wire gauge in thickness. Duty was assessed at 45 per cent., that all wire valued at over 4 cents a pound shall pay a duty of not less than 45 per cent. ad valorem. Appellants claim that the merchandise is flat rolled iron, and should have been rated at 1 cent a pound.

It appears from expert evidence, and an examination of the samples submitted by the importer, that the flat strips in question are cold rolled from drawn wire, and subsequently drawn through dies or grooved rolls to give a uniform width and thickness and smooth edges. The merchandise is consequently dutiable under the provisions for wire, as above.

In the case of a protest against the assessment of duty on certain brass wire the appellants claimed that duty should have been assessed at 35 per cent., for manufactures, instead of at 45 per cent. T. L., 186, provides for manufactures of copper or of which copper shall be a component material of chief value. T. L., 216, makes provision for manufactures or articles composed wholly or in part of copper or any other metal. As either paragraph is applicable to the merchandise in question, the collector very properly assessed duty under that providing the higher rate.

In a case of wheels for bicycles the appraisers say the goods are "wheels" of steel for bicycles and tricycles, and are claimed by the importers to be dutiable as follows: "Wheels, or parts thereof, made of iron or steel, and steel-tired wheels for railway purposes, whether wholly or partly finished, and iron or steel locomotive, car, or other railway tires, or parts thereof, wholly or partly manufactured, $2\frac{1}{2}$ cents per pound. * * * It is plain that the words "for railway purposes" impose a limitation upon all the articles specified in the paragraph quoted. The intent of Congress is manifest, and we do not consider the language of the paragraph at all ambiguous. Wheels of the kind in question not being used "for railway purposes" do not fall under this paragraph. The assessment of duty upon them at 45 per cent. ad valorem, is affirmed.

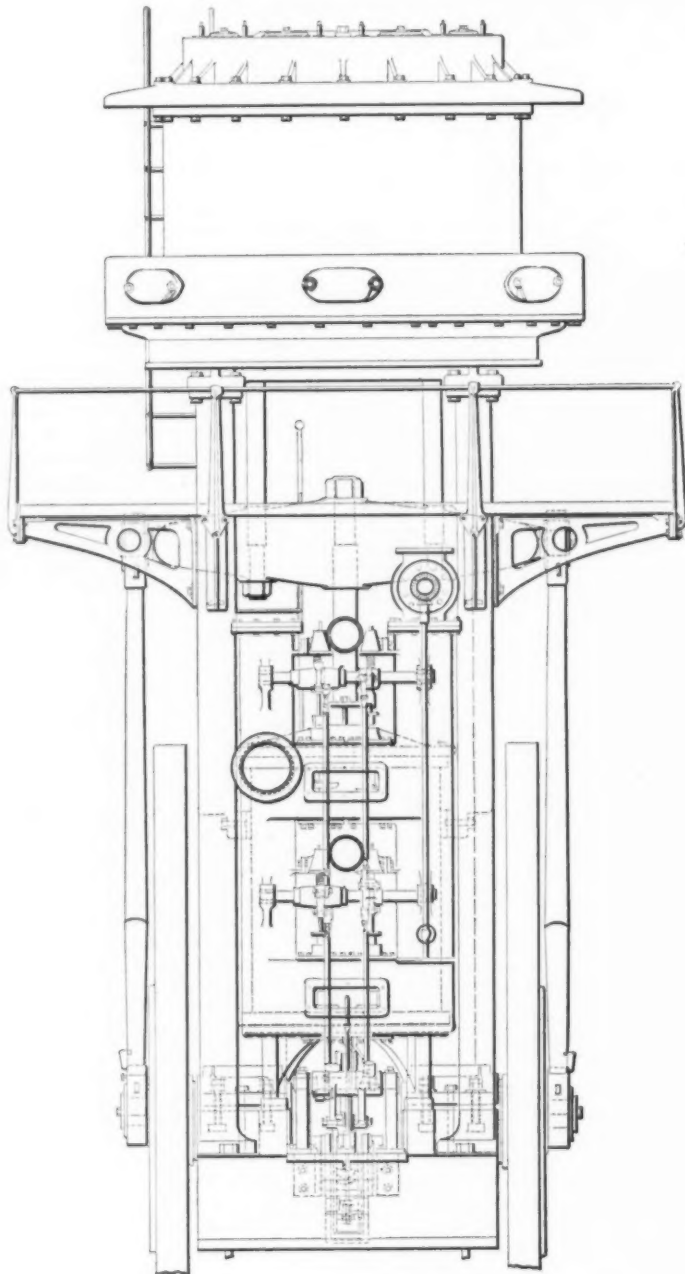
In a reappraisal of value made by the U. S. General Appraisers on sundry invoices of steel needle wire from Sheffield,

entered at 1s., 1s. 2d., 8d., 7d. and 6 $\frac{1}{2}$ d. per pound there was no advance. Discount 6 per cent. carriage to Liverpool included in prices.

The Cost of Aluminum.—A. E. Hunt, of the Pittsburgh Reduction Company, delivered a lecture at the meeting of the Society of Arts of the Institute of Technology, Boston, on aluminum, in the course of which he presented the follow-

pounds of aluminum per day, is very much larger than this; but the estimate is highly instructive, as showing how low is the theoretical cost of production by the electrolytic process.

For a number of years the firm of H. K. Porter & Co., builders of light locomotives at Pittsburgh, have made it a practice to divide a portion of their profits with the employees. The distribution is



Front Elevation.

BLOWING ENGINE.

ing statement of the theoretical cost per pound of aluminum:

2 pounds alumina (Al ₂ O contains 52.94 per cent. Al ₂) at 3 cents.....	\$0.06
1 pound of carbon electrode at 2 cents.....	.02
Chemicals, carbon dust, and pots.....	.01
22 electrical horse-powers exerted one hour (water-power being used).....	.05
Labor and superintendence.....	.03
General expense, interest and repairs.....	.03

Total cost of 1 pound of aluminum...\$0.20

Of course the cost of production by the small plant of the Pittsburgh Reduction Company, with a capacity of but 375

made once a year, and the amount given to each employee is determined by the number of years he has been in the employ of the firm and whether his labor is skilled or common labor. The high-class workmen receive larger dividends than the common laborer. The annual distribution took place last week.

A bill to incorporate the Whirlpool Bridge Company, capital \$500,000 has been introduced into the New York Legislature. L. W. Haydon of this city is among the incorporators.

Blowing Engines.

The blowing engines here illustrated were designed and built by Gordon, Strobel & Laureau, Limited, of Philadelphia, for the Carnegie Iron Company's furnaces at Johnson City, Pa. They are the vertical type usually employed by blast furnaces, with improvements in the steam valve gear and the inlet and outlet air valves for the blast cylinders.

the steam cylinders at the side and to the blast cylinder heads at the top, securely combining these several parts.

The steam piston is provided with one steel piston rod 6 inches in diameter fitted into the piston head with an inverted tapering end and secured by a nut, and to the center of the crosshead with a parallel end secured by a nut. There are two steel piston rods connecting the crosshead with the blast piston, each $4\frac{1}{2}$ inches in

the center, the crosshead pins being 6 inches in diameter and 6 inches wide. By the three piston rod arrangement the load is more evenly distributed on the crosshead and the blast piston, and at the same time a more closely connected engine is obtained.

The fly wheels are so designed that the center plates are slipped with the shaft and wrist pins in place. In constructing them the plates are first bored and faced. The wheel segments are then fitted to them. Bolt holes are reamed and all carefully marked. The center plates are then forced on the shaft and keyed on, after which, by the aid of special tools, the crank-pin holes are bored and hubs faced, thus insuring accuracy in radial distance and alignment.

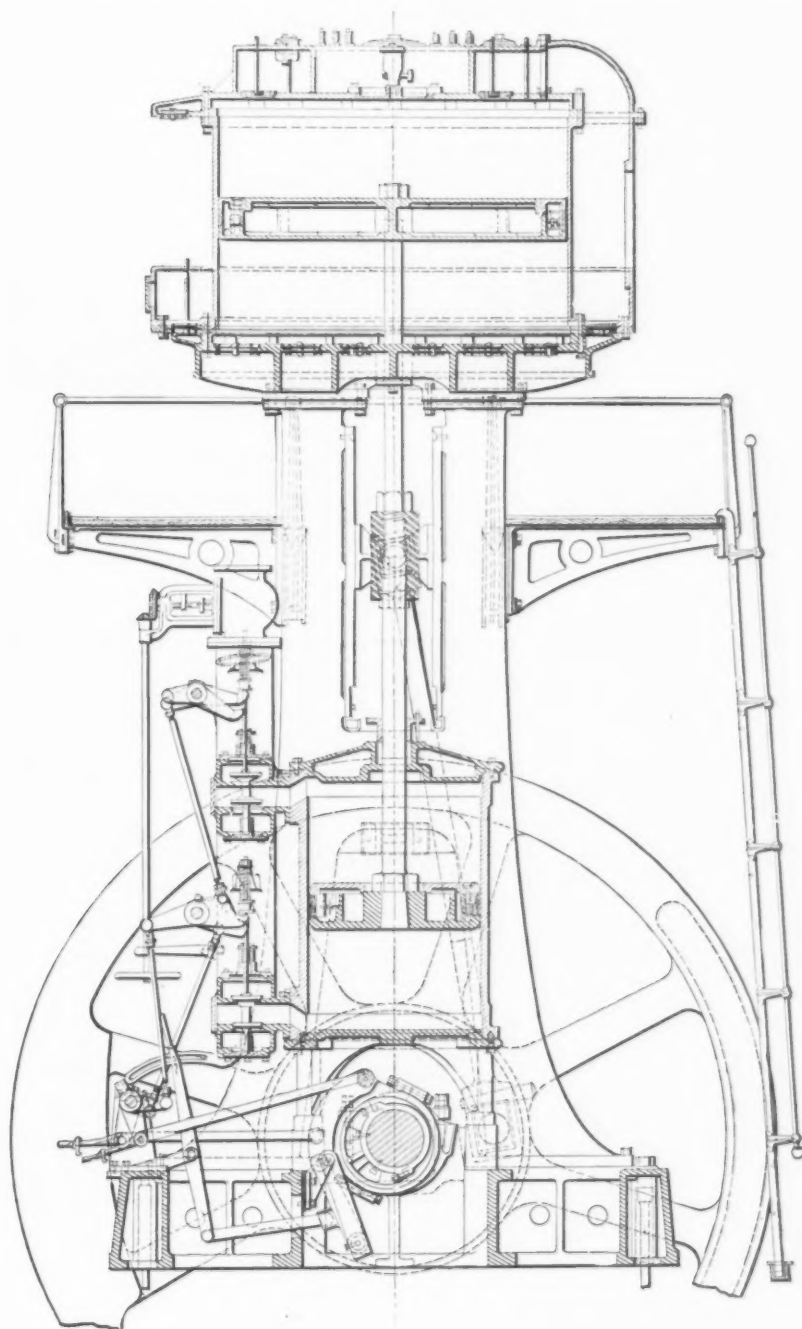
The air inlet and outlet valves in the blowing cylinders are so disposed that the dead space or clearance is reduced to a minimum, while every valve seats by gravity, requiring neither springs nor counterweights. The aggregate area of these valves is very large, securing a free ingress and egress of the air. A diagram, Fig. 8, taken from one of this type of blowing engines shows neither suction on the inlet side due to the air being impeded at entrance, nor compression on the discharge side. This is due not only to the large area through the seats, but to the freedom with which the valves open. The inlet valves are made of the best sole leather, and rise from their seats with the slightest current of air. If they were held to their seat by springs, the ingoing current must overcome the resistance of these springs, which, though slight when the valve is just leaving the seat, rapidly increases, soon presenting a formidable resistance to the entering air. This is especially true if the valves are made small. The outlet valves are lifted from their seats as easily as the inlet valves. They are slightly heavier than the inlet, due to the additional weight of an attached plate of steel, $\frac{1}{8}$ inch thick. All valves seated by springs, no matter how weak, when the valves leave their seats (heavy valves or small valves with leather hinges) present a serious impediment to the air currents at high speeds.

The valves are illustrated in detail by Figs. 3 and 4, Fig. 3 showing the outlet valve. The seat is set into the head, its lowest surface being even with the inside of the cylinder head to avoid clearance. This seat is faced where it rests on the cylinder-head casting, requiring no jointing, such as sheet gum, &c. The surface upon which the steel valve rests is faced true, and the steel valve (turned on the edge and ground by special emery grinder) plays between bored guides. The guard holding the seat in place receives the upward blow of the valve. The valve is faced with leather to lessen the noise, and is held in place by a center bolt. This bolt is released from outside the cylinder, and the guard, valve and valve seat may be at once removed through the hand holes shown.

Fig. 4 illustrates the inlet valves. The seat of the inlet valve is set into the head on a machined surface, and is secured by a single bolt from a three-legged guard and valve guide. These valves all seat by gravity, and by removing the nut on the central bolt the seat and valve are taken out and a new valve inserted quickly.

Fig. 5 shows the action of the variable cut-off gear, and Figs. 6 and 7 are indicator cards taken from one of the blowing engines supplied with this gear. From this diagram it will be observed how perfect is the action of this gear. In the variation of the follow, from one quarter to three quarters stroke, the lead never varies in the least, while the exhaust gives an equally free escape to the steam.

The steam and exhaust valves, shown in the sectional elevation, are of the



Vertical Sectional End Elevation.

BLOWING ENGINE.

The steam cylinders are 42 inches in diameter; blast cylinders, 84 inches in diameter, and stroke, 4 feet. The bed plates are made in box form, 27 inches deep and 13 feet long, having solid sides and tops and cored openings on the bottom. The shaft bearings are independent and fitted upon the top of the bed plate in the center, giving at that point full depth. The shafts are 15 inches in diameter, fitted in babbitted adjustable bearing boxes 24 inches wide. The housings are made in one piece, box form, and are bolted to the bed plate at the bottom, to

diameter. These are securely fitted into the crosshead and blast piston with parallel ends and secured by nuts. The steam cylinder piston heads are 11 inches deep, fitted up with two cast-iron packing rings, set out with a follower ring and steel springs and bolts.

The blast cylinder piston heads are 10 inches deep, fitted up with a brass packing ring made in eight segments, these segments being fitted to each other with broken joints and the whole set out with steel springs and bolts. The crosshead is a wrought-iron forging, 24 inches deep in

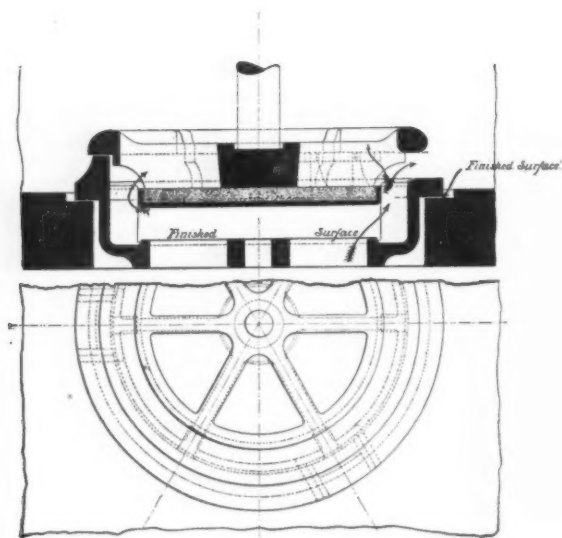
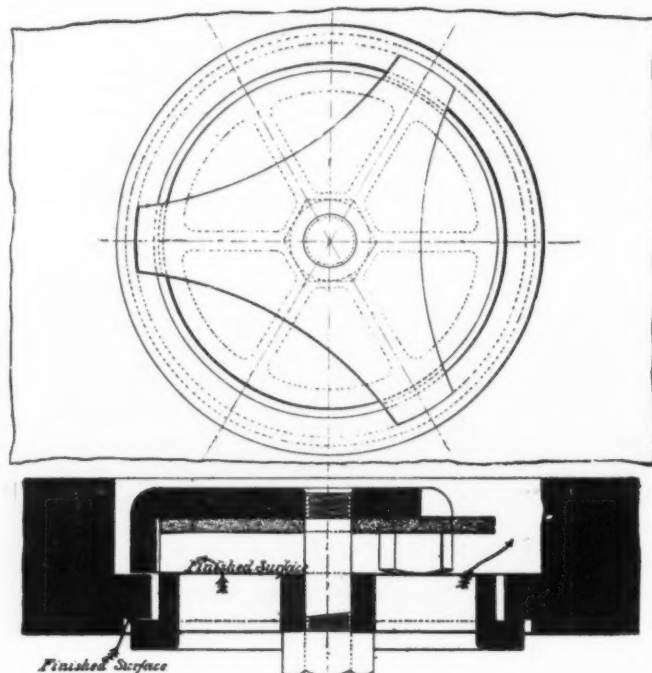


Fig. 3.



This Drawing is on Larger Scale than Fig. 3.

Fig. 4.

Details of Inlet and Outlet Blast Valves.

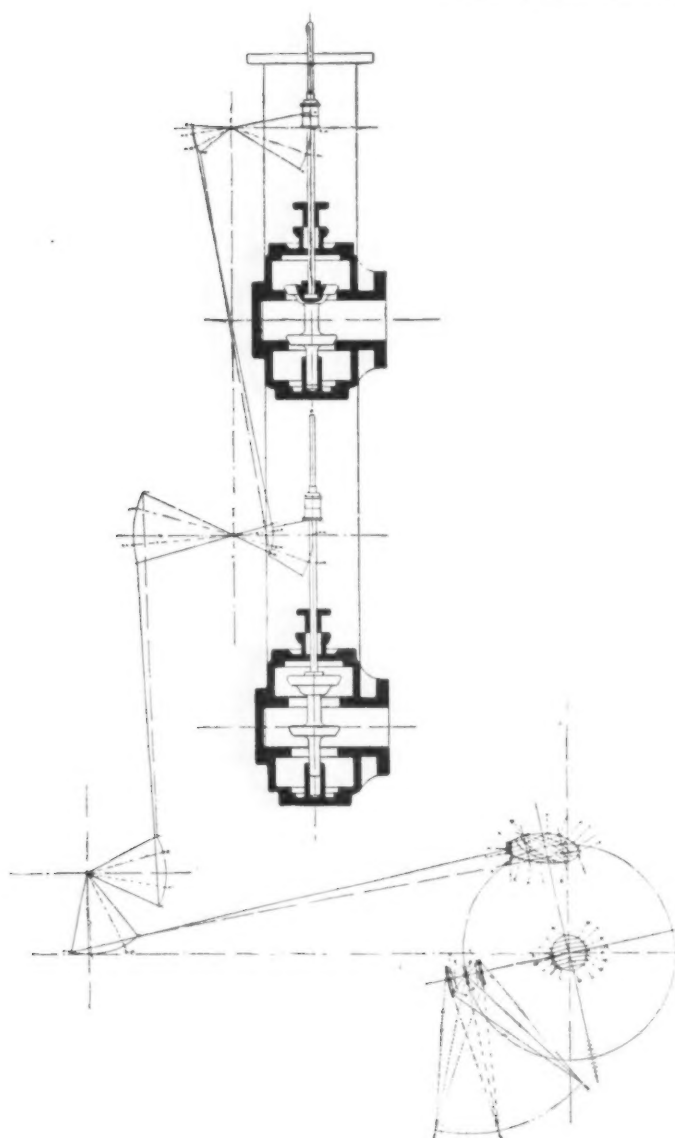


Fig. 5.—Diagram Showing Action of Variable Cut-Off Gear.

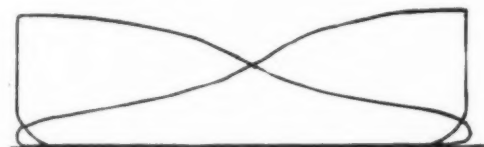
Fig. 6.—Steam Cylinder Diagram.—Revolutions, 34; Cut-Off at $\frac{1}{4}$ Stroke; Spring, 40 Pounds; Steam Pressure, 60 Pounds; Throttle Wide Open; Average Effective Pressure, 30.6 Pounds.Fig. 7.—Steam Cylinder Diagram.—Cut-Off at $\frac{1}{4}$; Engine Throttled; Revolutions, 34; Steam Pressure, 60 Pounds.

Fig. 8.—Blowing Cylinder Diagram.—Revolutions, 31; Spring, 10 Pounds; Blast Pressure by Gauge, 4.5 Pounds; Average Pressure, 3.92 Pounds.

BLOWING ENGINE DETAILS.

double puppet balanced type and are actuated from a single eccentric, keyed to the main shaft, its center being coincident with the center of wrist pin. The direction of the yoke's motion is varied angularly by a lever connected to it at a point 90° from center of eccentric. This lever has its fulcrum upon the end of a second lever, vibrating in fixed bearings, the distance between the center of fulcrums and centers of connections being equal in these two levers.

The steam and exhaust eccentric rods are pinned to the upper part of the eccentric yoke. Each of these rods is provided with disengaging hooks. From this point the action is carried to the valves by means of rods and crank arms. By this arrangement at $\frac{1}{4}$ inch cut-off of steam a lift of $\frac{1}{8}$ inch is obtained at the valves, and at a $\frac{3}{4}$ inch cut-off a lift of $2\frac{1}{2}$ inches is obtained. The point of cut-off can be varied with perfect ease during the action of the engine.

Defects in Design of Open-Hearth Steel-Melting Furnaces.*

BY H. D. HIBBARD, PITTSBURGH, PA.

It is not intended in this paper to cover the whole field of possible or actual defects which may exist in the many parts of an open-hearth furnace. Those here considered have all come under the writer's observation in regular work, and are all he can recall at present.

In some of the cases the means used to counteract the defects will be pointed out. In many the obvious cure is apparent as soon as the true state of affairs is recognized. Some apply only to furnaces fired with artificial, not natural, gas.

They are enumerated below with remarks on each following in order.

They are:

1. Too small gas-ports and ducts.
2. Too small air-ports and ducts.
3. Too large gas-ports.
4. Too large air-ports.
5. Too small regenerators.
6. Too closely-piled checker-work.
7. Too small flues and stack.
8. Working hearth at too low a level.
9. Gas and air ports beside each other.
10. Regenerators in which draft is horizontal.
11. Too thin walls and brickwork.
12. Use of clay bricks.
13. Circular hearths.
14. Furnace with ends unlike.

1. *Too Small Gas-ports and Ducts.*—The trouble from this comes, of course, because enough fuel cannot be introduced into the furnace, and the melter complains that the furnace does not work well. Stirring up the gas-makers and calling for more gas does not help it much. A furnace I have had in charge improved its working qualities after 150 or 200 charges, when the gas ports and ducts had been enlarged by the fluxing of their sides by the oxide of iron carried over from the working chamber, allowing freer passage to the gas. A furnace which has been through this experience will, of course, have these passages made larger at the next general repair.

Too Small Air-ports and Ducts.—This is a serious defect when present, and will not usually correct itself as the furnace grows older in use, as will the preceding, for the reason that the heat is less in the air-ports and ducts. Their lower temperature is because of their greater distance from the working chamber, they being usually nearer the cold outside of the furnace, and, being longer, do not get their share of the outgoing gases from the hearth. All of these that can find room seek the more direct route through the gas regenerator.

This trouble is incurred, as is the preceding, by not taking into consideration the great expansion of the ingoing gas and air, due to the high temperatures they acquire in traversing the hot flues and regenerators. Air increases one volume for every 273° C. it is heated, and, as it doubtless enters the hearth at at least four times that temperature, at least four times as much area of cross section must be provided for in the ports near the hearth as it has at the regulating valve where it enters the furnace.

If this case exists, care must be taken to keep the amount of gas in the furnace down to that which the entering air will burn effectively. Any excess of gas beyond this will cool the furnace. If, with this precaution, the results are not good enough the furnace must be altered. Blowing in air as a cure is not advisable, though it might be done if the gas-ports were too large, so that the out-going gases could find vent to the chimney without too strong draft being required. Too strong draft would draw an unusual amount of cold air into the ducts and regenerators, through the crocks in the brickwork cooling them unnecessarily, thus injuring the working of the furnace.

3. *Too Large Gas-ports, and (4) Too Large Air-ports.*—We will consider these together, because, if they exist together in the same furnace, they tend to counteract each other to some extent, but if only one is too large, trouble arises demanding attention.

The effect of too large ports for either gas or air is that these ingoing fluids, seeking naturally the shortest route, will fill the ducts and ports nearest the front of the furnace, where they enter to their full capacity, so that those on the back side receive little or none. An even distribution of gas and air over the hearth is desired; but, if either has too great passages, it will rise too plentifully at the front, and flowing into the hearth, give a badly distributed flame, and of course, bad work. In the portions of the hearth where air is too plentiful, too much waste of stock occurs, and where gas is in excess, a dull smoky flame too cold for good melting is found.

To remedy these defects the ports nearest the front, or the bridge wall, if one is used for the air to pass over, must be partially closed, which may with many furnaces be done, when running, by loose bricks placed in by means of hooks. The bridge wall is easily built up from a hole opened in the end wall of the furnace, and bricks can be added on the front side until a regular distribution of air obtains.

Another way of guarding against the effect of too large air ports in a furnace using producer gas is to have the gas ports brought nearer the front side of the hearth. This will also counteract the effect of any air drawing in around the doors, which too strong chimney draft would cause. The excess of air in front is met with the excess of air, and if the latter is not too great, fair distribution of the flame results.

A furnace cannot be affirmed to have too large gas or air ports until it is up to full melting heat. When first started, and the entering gas and air are quite cold, the front port or ports may seem to be doing all the work, but when these inflowing gases are hot, and therefore of much greater bulk, all the ports may be used to their full capacity. An excess of capacity in the ducts does no appreciable harm if the ports are of the right size.

5. *Too Small Regenerators.*—These cause waste of fuel, because of the heat lost in the outgoing gases due to the high temperature at which they escape into the chimney flue. All heat which passes the reversing valves is lost. The valves themselves suffer from the high temperature to which they are thereby exposed, and often require repairs or renewal from this cause.

With ample regenerators they may still be damaged by the use, or rather misuse, of too much gas in the furnace, which prolongs the flame down into the regenerators, and even to the valves. I have seen them red hot from this cause, which, of course, is not the fault of the designer, but the larger the regenerators the less likelihood of such trouble.

Too large regenerators will hardly be put in. I never heard of any trouble laid to that cause, nor can I think of any reason to expect trouble from using any large size which would seem in the least reasonable. By making them large they are less damaged by heat, give longer runs to the furnace and economize fuel.

6. *Too Closely Piled Checker Work or Regenerator Bricks.*—This often comes from an attempt to correct the defect of too small regenerators. The result is naturally the partial stoppage of the gases passing through either at once when the furnace is new, though it is seldom as bad as that, or after running a greater or less time proportional to the degree of the defect. While the furnace is operated the spaces in the checker work of the regenerators are gradually filled with oxide of iron in the form of dust, which is carried over by the draft, some being deposited in the regenerators and flues and some issuing at the top of the chimney at times as a light brown smoke. In the hottest parts of the regenerators this oxide of iron fluxes the bricks, the molten material formed runs down and chills in the lower and cooler parts, and so hastens the stoppage of the passages for the gases. When these passages are not large enough at first, due to the defect we are considering, a short run only can be made before a shut-down is forced.

7. *Too Small Flues and Stack.*—This defect requires, of course, but little consideration here, as after it is recognized the cure is obvious.

The flues between the regenerators and reversing valves and the chimney flue collect some of the oxide of iron brought over from the hearth, the deposit being heavier the nearer the furnace. This deposit will in time grow large enough to interfere with the working of the furnace by restricting the flue area, unless there has been ample excess provided for it in the furnace design.

The stack, if large enough at first, will remain so, as it is not liable to stoppage.

It should be borne in mind that, as the drawing power of a stack depends on the temperature of the gases within, that one which is ample with small regenerators, and consequently hotter escaping gases may be not high enough with larger regenerators, which cool the gases much more before they reach the stack. More height, but not more area of cross-section is needed in the latter case. In fact, less sectional area would serve, as the volume of escaping gases, due to their lower temperature, is less than in the former case.

8. *Working Hearth at Too Low a Level.*—This is with reference to the point of entrance of the air and not the ground or working floor, though it usually will be to the ground also, as the air nearly always enters at about its level.

The point is as follows: A regenerative furnace to work well and be under complete control, must have both gas and air introduced to the working chamber under pressure, the chimney being used only to take away the waste gases as fast as formed. Bad work, and especially heavy waste of iron will result if the chimney draft is used to draw air or gas into the furnace. When it is used at all to assist in this way it will also draw cold air in through the cracks around the doors and in the brickwork which will injure the heat of the furnace.

* Read before the Engineers' Society of Western Pennsylvania.

Gas from producers is forced in by the pressure of the steam blast under the fires; natural gas, by the pressure from the wells. Therefore the gas needs not this precaution, but with the air the case is different. In a furnace with a high-working hearth, having in consequence high regenerators and a very considerable difference in level between the air valve and hearth, there is a column of air of that height, strongly heated and rarefied, which causes it to rise and flow into the working chamber unaided.

When, from any construction, this column of heated air is too low, so that an outward pressure or plenum cannot be maintained in the working chamber, together with a suitable flame, air should be blown in preferably by a fan blower. Indeed, the working of many, if not all furnaces, would be improved by being supplied with air under greater pressure than it usually has.

9. *Gas and Air Ports Beside Each Other, or Arranged so as Not to Bring the Air into the Working Chamber Above the Gas.*—The air should enter above, because this keeps the flame down on the charge, which is thereby melted faster and away from the roof, which is then not melted so fast, two desirable conditions to maintain.

The incoming air, though heated, is still colder than the other gases in the working chamber, and therefore tends to flow down along the bottom of the chamber, as does cold air entering a warm room. If there is no gas below to intercept and burn it, undue oxidizing conditions will exist around the charge, and too much waste and its consequent trouble ensue. The chief reason, though, for introducing the air above the gas has been the preservation of the roof, though this is becoming less urgent as higher roofs become common. Better combustion also results from the intimate mixture of the gas and air caused by the latter falling into and through the flame from above.

10. *Horizontal Regenerators.*—By this is meant those in which the gases flow horizontally instead of vertically or diagonally, as is usual.

In horizontal regenerators the outgoing gases, being hotter than the chamber, naturally flow out along the upper levels, while the ingoing, being colder, flow in along the lower levels. As a consequence, much of the efficiency of the regenerators is lost. The top keeps hot and the bottom cold, comparatively speaking. The waste gases reach the chimney hotter and the ingoing reach the hearth colder than the size of the regenerators ought to permit.

If the regenerators are built as flues and their cross-sections are so small that the whole area is needed to convey the moving gases, this evil is avoided; but another one is met—namely: that as soon as the effective area is reduced by the deposition in the regenerators of dust carried from the hearth, they will be too small for their purpose.

Enlarging the regenerators will not greatly increase their effectiveness, if they are shown to be inadequate, by the high fuel consumption and high temperature of the waste gases, as long as the principle of the horizontal draft is adhered to.

11. *Too Thin Walls and Brickwork.*—It is a question just how thick these should be, but in general they should be so thick that working about the furnace is reasonably comfortable as regards heat, even in summer. This is especially applicable to the doors, which are sometimes bricked up only 2½ inches thick, making it warm for the workmen.

As with high roofs and increased skill in judging the temperature of the hearth by the melter, the life of the furnace, and especially of the roof, is being prolonged, the writer thinks the time has come for

increasing the thickness of the roof over the regulation 9 inches. More bricks, or, perhaps better, an equivalent thickness of sand, which will rise and fall with the roof, would save much of the large amount of heat now lost by conduction through the roof with an equivalent saving of fuel.

12. *The Use of Clay Bricks* is, in the light of current practice, to be considered a defect. Campaigns of 1000 heats or over being at least occasional, and of 500 quite common, clay bricks giving 100 are dear at any price, or even no price.

13. *Circular Hearths.*—The evident faith of designers of these hearths was that the flame would spread itself out as it entered the hearth, so as to insure an even heating in all parts. Instead of this, however, we find the flame taking its straight path through the chamber, melting a swath through the charge at first, the stock out of its course melting with heavy waste afterward. Probably no more of these will ever be built, at least until those who have used them have left the steel business.

14. *Furnace with Ends Unlike.*—This is of course, very unusual, due to the local situation in the shop, only one case being known to the writer. The regenerator at one end of a furnace was cut off to make room for another furnace, the equivalent regenerative capacity being secured in another way. The chief trouble came from the difference in draft in the two ends. As a consequence, seven different motions were required to reverse the furnace, viz.: 1, shut off gas; 2 and 3, throw the two reversing levers; 4, turn on gas at the other end; 5 and 6, adjust two air valves; 7, adjust chimney damper. Natural gas was used. Still the furnace was made to work after a fashion, though at the first opportunity it was restored to its original form, as the room seemed to be used more profitably that way.

To conclude, a furnace may have several of these defects, which, perhaps, will only be recognized successively. As one is remedied it brings into prominence another which, being righted, may develop a third, and so on. Much time and money are usually wasted before a furnace defectively designed is brought into proper shape and has suitable proportions all through for good work. Frequently entire rebuilding would be the cheapest cure in the end.

Some furnaces may work well for short runs, and only show the effect of bad design when, due to increased skill of the melters, long campaigns become possible were the furnace rightly built. The proof of a furnace is, of course, its record in the hands of competent men, and one which has melted 500 heats at a fair rate and with good economy of fuel ought to be altered with extreme caution, if at all.

Galvanized vs. Tinned Sheets.

It is an interesting fact just now for purchasers of galvanized sheets that the latter are netting American makers less for guaranteed sheets No. 27 gauge than importers are getting for guaranteed brands of terne or tin roofing plates. Galvanized sheets of No. 27 gauge also have the advantage of being heavier than terne plates as to the original sheets used and as to the coating, thus rendering them far more substantial and durable. As galvanized sheets are also much larger in size they are not only much more economical to apply, but also far more effective for roofing. Metal roofers should note this and profit by it, especially for guttering and spouting.

A lengthy and valuable progress report has just been made by the Committee on Standard Rail Sections of the American Society of Civil Engineers. G. Bonscaren is chairman and A. M. Wellington secre-

tary; the other members being V. G. Bogue, J. Foster Crowell, S. M. Felton, Jr., H. Stanley Goodwin, J. D. Hawks, R. W. Hunt, George S. Morison, E. D. T. Meyers, Samuel Rea, Thomas Rodd and F. M. Wilder. Each member proposed designs for a set of sections, which the secretary has canvassed, reporting in what respects they agree and disagree.

Cold Saw Cutting-Off Machine.

The Armington & Sims Engine Company of Providence, R. I., now use a cold saw cutting-off machine. They find its use advantageous, as it makes an accurate and clean cut. It runs at a rate of 90 feet of cutting surface per minute, and cuts through the A shaft 3¼ inches in diameter, in about four minutes. The saw runs in a tank containing a solution made up of 10 pounds of whale-oil soap, 15 pounds of sal soda, 2 gallons of best lard oil, with water added to make 40 gallons of mixture.

The company have put in many other large tools since the new addition has been occupied and are full of business. Lieutenants Kellogg and Blandin, United States Navy, have been in Providence frequently of late inspecting the engines and dynamos for Government vessels. Three combined engines and dynamos have been sent to the United States steamship Newark, and two more are to be delivered at once for installation in the Miantonomoh. These engines are double upright engines of marine type, with cylinders 7 inches in diameter by 5-inch stroke, running at 400 revolutions per minute and driving a Thomson-Houston special 100-ampere, 80-volt dynamo by Brotherhood coupling. Other important work for private patrons is under way.

The works have recently put in a private telephone line with 20 stations throughout the shops. Connections are made by a modification of the knife-blade switch, the switch lever playing over an arc of about 180 degrees, on a bracket just under the transmitter. Here, as in other machine shops, the milling machine is doing more and more of the work formerly sent to the planer. The sides of connecting rods are milled with a cutter made of hardened machinery steel, which is found to be quicker, cheaper and as efficient as to make them of tool steel.

Jones & Laughlins, Limited, of Chicago, have issued a neat pamphlet addressed to the trade, containing their statement of the way in which they make their mild or soft steel, which was recently printed in our columns. They have added some remarks relative to their special brands of merchant bar iron, long known under the names of "American Refined" and "Clair." The name of their regular brand was taken from the name of their Pittsburgh works, "American Iron and Steel Works," and not, as many have supposed, merely indicating iron of American manufacture. The special qualities of these brands are fully set forth in the pamphlet.

The Queen and Crescent route has issued Tariff No. 27, giving the rates on pig iron from Southern furnaces, to take effect March 1, which is substantially the rate list published in *The Iron Age* of September 18, 1890, page 457.

The geology of the famous Sudbury copper nickel deposits, and the mode of occurrence of the ores has been made the subject of a brochure by Dr. Robert Bell, assistant director of the Geological Survey of Canada. It has been made one of the bulletins of the Geological Society of America.

No. 1 Universal Grinding Machine.

The perspective views, Figs. 1 and 2, give a general idea of the No. 1 Universal Grinding Machine, built by the Brown & Sharpe Mfg. Company, Providence, R. I.

whole taper, which is the angle the swivel table is set out of line. By this arrangement very exact settings can be easily obtained. The T-slot extends the whole length of the table and receives the heads of the clamp bolts, by which the head and foot

at the lower edge of the wheel bed is graduated to degrees so that it may be set at any desired angle, in a horizontal plane, relative to the sliding table. When properly set it is clamped by a bolt on each side of the standard. The wheel slide moves on wide, flat bearings and is held in place by a 45° gib. This and the forward projecting dust cover completely protect the slides from dust.

The wheel platen rests on a flat, circular bearing, the mean diameter of which is greater than the distance between the bearings of the wheel spindle. A steady support for the wheel stand is thus provided and rocking is prevented. The wheel platen may be set in any position, and is held in place by a bolt on each side. The object in having the wheel platen swivel is to enable the operator to bring the face of the wheel parallel with the line of travel of the wheel slide. In internal grinding the wheel platen is turned around, a speed counter is used in place of the wheel stand, and an internal grinding fixture is placed on the end projecting over the swivel table, as shown in Fig. 4. The wheel stand is secured in any position on the wheel by two T bolts. These, with the two bolts in the wheel platen, and the two bolts in the wheel bed, form a rigid connection with the heavy rearward projection of the base. The wheel guard is bolted to the wheel stand. It shields the operator from sparks, dust and water, and is sufficiently heavy to protect him in case of accidental breakage of the wheel. The feed is engaged by pushing a knob in the center of the hand wheel on the front of the machine. The connection is positive, and cannot become disengaged by vibrations of the machine. When desired the table can be moved by the hand wheel.

The motion of the table is automatically reversed by a lever, which is actuated by dogs that can be set at any position the same as the dogs on a planer. For very delicate adjustment of the length of stroke requisite in grinding up to a

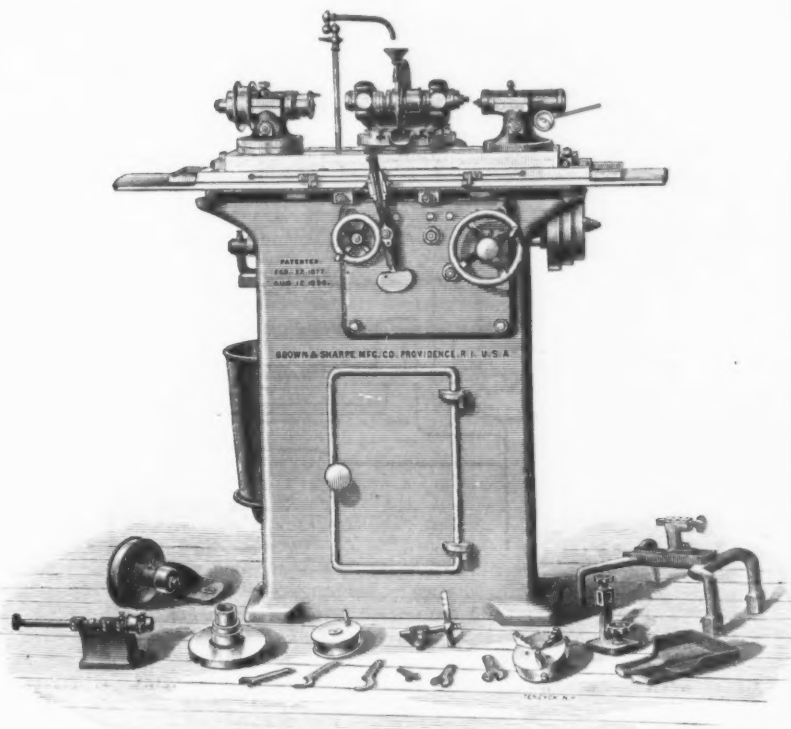


Fig. 1.—No. 1 Universal Grinding Machine.—Front View.

The design is well adapted to resist vibrations within the machine itself—an element essential to the durability of the machine and the accuracy of its work.

The base rests upon three points or feet and is fitted as a closet for the tools and accessories used about the machine. The bed and base are cast in one piece and the sliding table moves upon the bed on one V and one flat slide, as shown in Fig. 3. The ways are lubricated by two rolls in each. Thus the oil is equally distributed over the bearings and the proper position of the sliding table is maintained, a feature of some consequence in accurate grinding. The waste oil from the mechanism in the bed can be drawn off through a pipe from the bottom of the bed. The shallow basins or pockets, one at each end of the sliding table, form convenient places for wrenches and other tools in frequent use about the machine, and the dust caps beyond the basins protect the slides when the table travels to its extreme movement. These caps are curved so that weights cannot conveniently be placed at the extreme ends of the platen.

The head and foot stocks are mounted upon a swivel table, which rests upon the sliding table and turns on a central stud. The line of centers accordingly can be set at any angle with the table slides, for the purpose of grinding tapers without throwing the head and foot stock spindles out of line. When set to any desired position, the swivel table is clamped for heavy work at each end to the sliding table. In ordinary work, however, the weight of the table gives sufficient stability, so that clamping is not required. For setting the table accurately to grind any desired taper an adjusting screw is provided and a scale graduated to show the taper both in degrees and in inches per foot. The graduations marked "Taper in inches per foot," give the whole taper of the work, and those marked "Degrees," give the taper from the center line of the work or one-half the

stocks are secured. The slot is scraped to a straight edge and the tongues of the head and foot stocks are carefully scraped to fit the slot. The head and foot stocks may be set at any point on the platen, which is

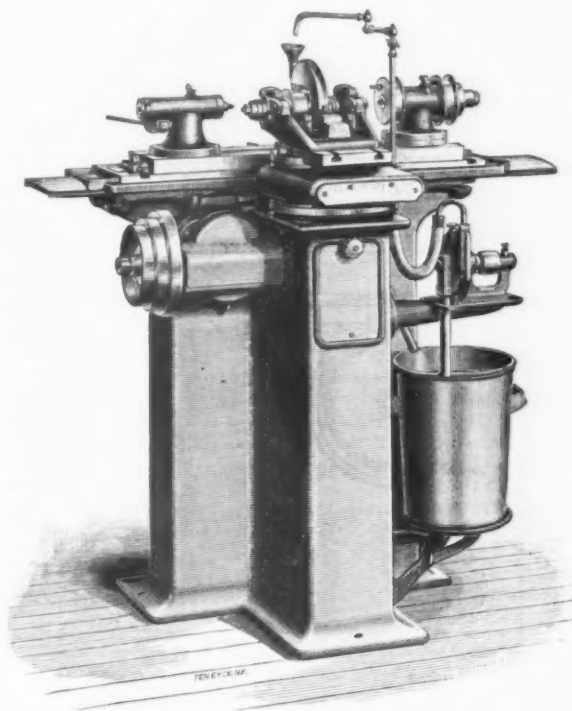


Fig. 2.—No. 1 Universal Grinding Machine.—Rear View.

a convenience in using the machine for a variety of purposes. The wheel is supported by the rearward projection of the base, shown in Fig. 2, which extends to the floor and stands directly upon one of the feet of the base. A semi-circumference

shoulder, &c., the lever carries a patented device. The lever and its adjoining parts are cushioned by a simple arrangement, so that the table is reversed without shock or jar—an important feature in accurate grinding. By raising the device on the

lever the path is cleared for the reversing dogs when it is desirable to move the table beyond the reversing point for trying work. This convenient arrangement preserves the adjustment of the length of stroke and at the same time allows any length of movement of the table by hand. By simply dropping the device down upon the lever, the machine will continue reversing as before. The wrench and nuts which secure the dogs in place are made in one piece, and are always in position. The cross feed by which the emery wheel is brought against the work to be ground is operated from the front of the machine by a hand wheel graduated to read to thousandths of an inch. The wheel is fed smoothly, whatever may be the position or angle of the wheel stand, wheel platen or wheel bed, and the universal features of these parts are extremely advantageous in grinding large tapers, either external or internal.

The headstock, shown in Figs. 5 and 6, is fastened to the table by a clamp screw and swivels upon a central pin. Its whole circumference at the lower edge is graduated to degrees so it can be set at any desired position. The spindle is made of tool steel, and the bearings are hardened, ground and lapped. The boxes are phosphor bronze. Their material makes it possible to run the spindle when they are tightly clamped upon it, and this clamping is necessary to obtain perfect face and hole grinding. The clamping adjustment is

the screws *a*. The end thrust is taken by a shoulder on the spindle, and adjustment for wear is made by a nut at the rear

very small limit. This bearing and the taper hole are ground when the spindle is in place. The spindle is made fast for

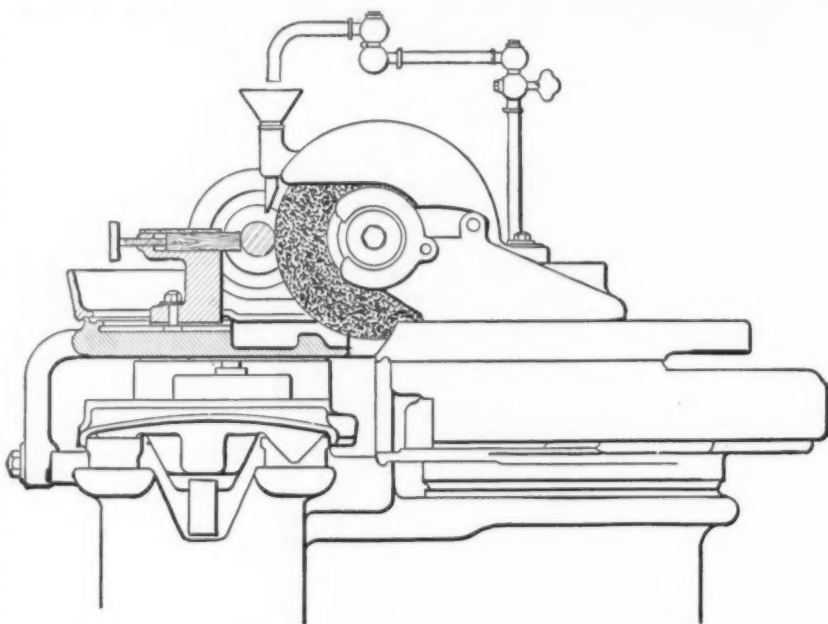


Fig. 3.—Vertical Transverse Sectional Elevation.

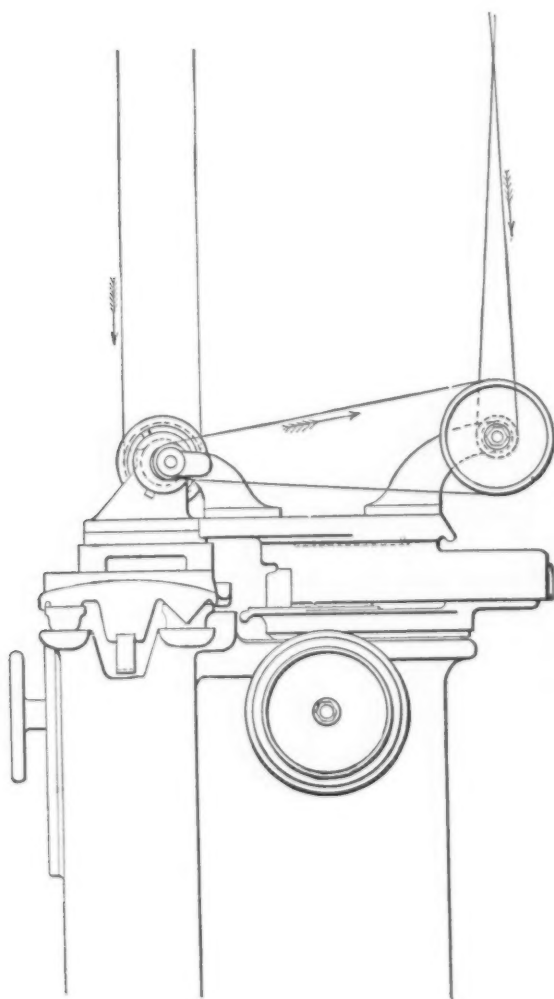


Fig. 4.—Arranged for Internal Grinding.

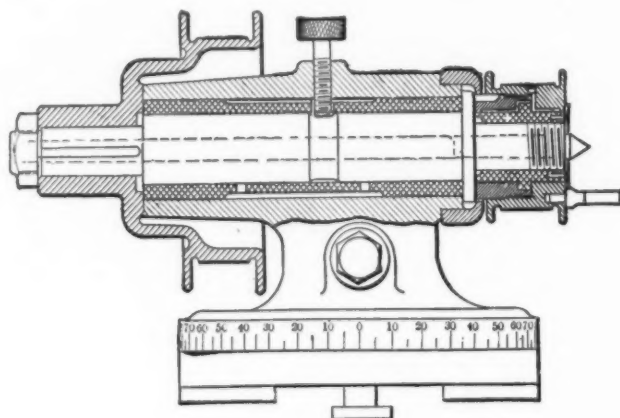


Fig. 5.—The Headstock.

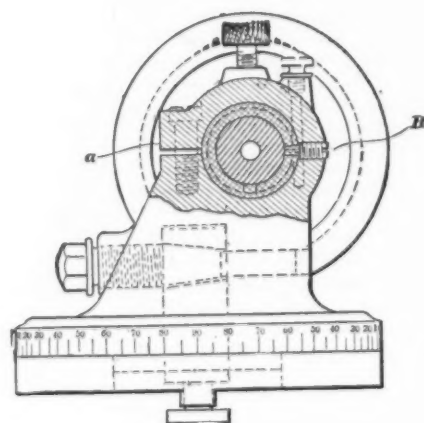


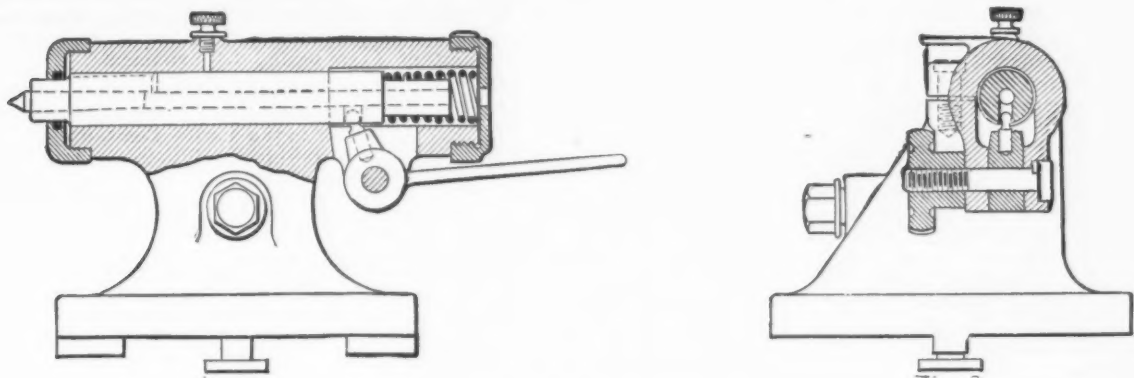
Fig. 6.—The Headstock.

NO. 1 UNIVERSAL GRINDING MACHINE.

simple and positive. Wear is taken up by screws, *a*. The screws *B* limit the extent to which the box can be closed, and should be loosened before taking up the wear by

end of the spindle. The thread on the forward end is not cut up to the shoulder, but a bearing is left so that chucks and fixtures can be made to run true within a

dead center grinding by a thumb screw. The headstock is provided with a pulley for driving the spindle and with small and large dead-center pulleys. Work may



Figs. 7 and 8.—The Footstocks.

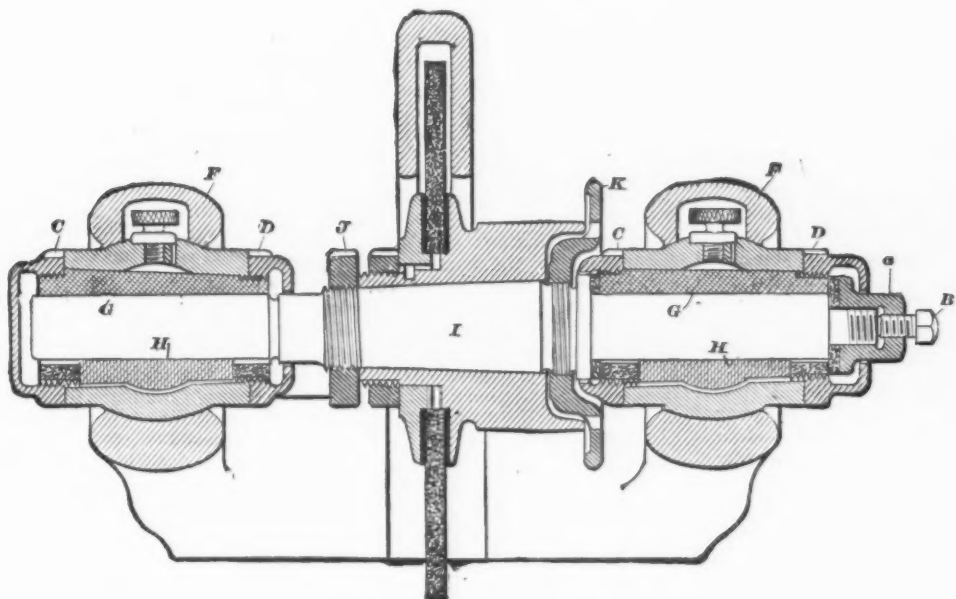
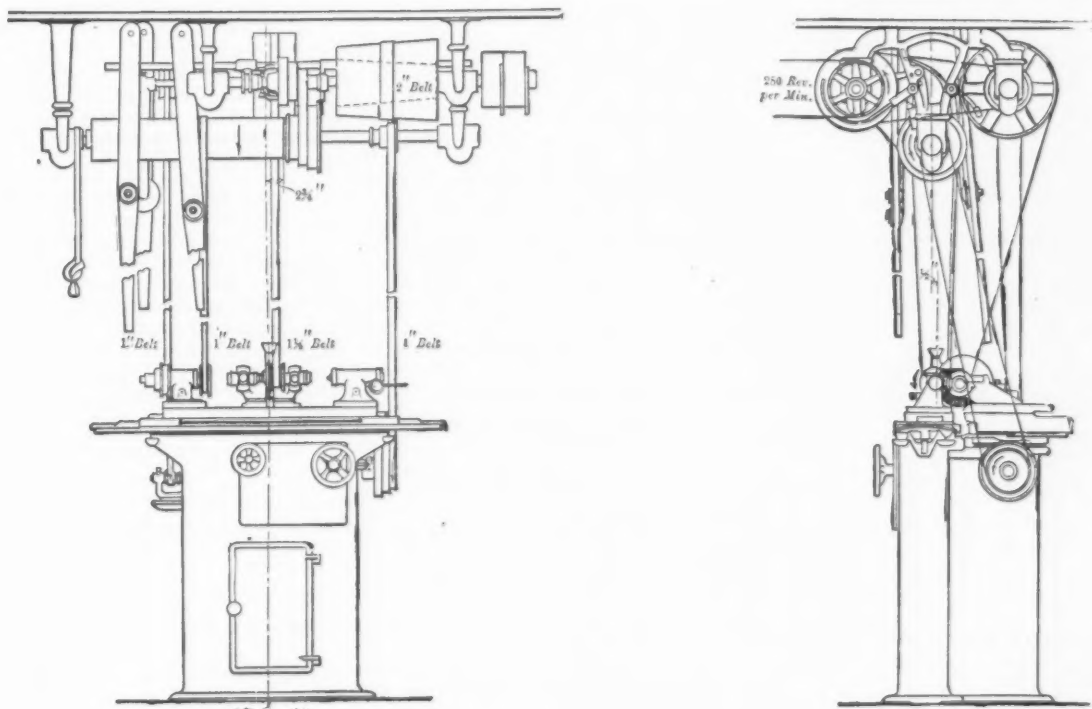


Fig. 9.—Section of Wheel Stand and Spindle.



Figs. 10 and 11.—Method of Driving.

thus be ground in a chuck or fixture on the headstock spindle, or upon two dead centers, or upon one dead and one live center. The advantage of grinding work upon two dead centers is that any possible imperfection in the spindle bearings does not affect the accuracy of the grinding.

The footstock, shown in Figs. 7 and 8, is secured to the swivel table by a clamp screw. The spindle is quickly operated by a lever, and the work is held between the centers by a stiff spring. By this arrangement the spindle adjusts itself to the varying length of the work caused by expansion, and the pressure between the centers remains substantially constant. An oil reservoir is provided for oiling the centers. Both head and foot stock spindles are hollow.

A section of the wheel stand and spindle is shown in Fig. 9. The spindle is steel, hardened, ground and lapped. The end play is taken up with the nut *a*; *B* is the check screw. Provision is made for delicate adjustment. The boxes are 3 inches long and $\frac{1}{2}$ inches in diameter. They are made of phosphor bronze, are self-aligning, and may be adjusted by the nuts *C* and *D*. Both nuts are turned toward the back of the machine to take up the wear, and the boxes with the spindle can be removed from the wheel stand without disturbing the adjustment of the boxes. An effort has been made to prevent vibration in the wheel. The bearings can be run metal to metal, and the wheel stand and adjoining parts are firmly connected with the rigid base of the machine. The driving pulley and the flange are made in one piece, the pulley being $2\frac{1}{2}$ inches in diameter. It is fitted to the taper arbor at *I*, and held in place by the nut *J*. A special speed counter is furnished for internal grinding, as indicated in connection with Fig. 4. The belt from the overhead works to the speed counter should be crossed. Our patented internal grinding fixture is used on this machine. Provision is made for wet grinding. The pump is a simple fan revolving in a loose case, and has connections for distributing the water either upon the wheel or upon the work.

The overhead works consist of three shafts with tight and loose pulleys 8-inch diameter for 3-inch belt. The shafts should run in the direction indicated by the arrows, Figs. 10 and 11, and are arranged for any speed from 2000 to 3400 for the emery wheel, and for six speeds between 93 and 640 for the work. The drum shaft is driven by a $1\frac{1}{2}$ -inch belt, the emery wheel by a $1\frac{1}{2}$ -inch belt, the feed cone by a 1-inch belt, the headstock spindle and dead center pulley by a 1-inch belt, and the pump by a 1-inch belt. The motion of the emery wheel is controlled by the main belt shipper, while that of the work is controlled independently of the wheel. By this means work can be changed on the center or chuck without stopping the wheel. This saves time and allows the wheel to be in full motion when starting to grind.

That no time may be lost in waiting for the work to stop revolving after it is ready to be removed from the machine, a friction brake is connected with one of the shipper rods. When the clutch is released the brake is applied, and the work may be stopped almost instantly. The relation of the countershaft to the machine is shown in Figs. 10 and 11. The speed of the countershaft should be about 280 revolutions per minute. The hangers are provided with self-adjusting and self-oiling boxes.

The machine will swing work between centers 8 inches diameter and 16 inches long, while the table may be fed several inches beyond that length. The swivel table will swing to either side of its central position to grind tapers from zero to

$1\frac{1}{2}$ inches per foot, or from zero to $3\frac{1}{4}$ ° in angular measure. For grinding work on the face plate or chuck the headstock can be set at any angle within the whole circle. The wheel slide has a movement of 4 inches, and may be fed at any angle from zero to 90° on either side of a line at right angles with the slide bed. The wheel stand will take a wheel 7 inches diameter and $\frac{1}{2}$ inch thick with a 2-inch hole in center. The internal grinding fixture usually provided with this machine will grind holes 5 inches long and $\frac{1}{4}$ inch and upward in diameter. Wheels not larger than 1 inch in diameter are used with this fixture. The weight of the machine, boxed ready for shipment, is about 2600 pounds. The floor space, measured over extreme projections and points of travel of the various parts, is 36 x 69 inches.

THE WEEK.

The position of the United States with regard to silver, from the standpoint of economics and fact, is examined by Franklin W. Lutz of the Treasury Department in a series of newspaper communications, and he remarks finally, "My conclusions, some of which have not been stated, are that the normal demand of this country for money is about \$27.50 per head of population; that this supply is maintained by the import and export of gold; that the silver law of 1878 did not put us upon the silver basis, because the annual addition to the stock of silver under it was less than the annual increase of the demand for money arising from the increase of population; that the silver law of 1890 threatens to put us on the silver basis, because it is likely to exceed that demand; that it is impossible for this country, by the free coinage of silver, to make the silver dollar of the same intrinsic value as the gold dollar; that the immediate result of the free coinage of silver must be the silver basis."

It is reported that the purchasing departments of the Union Pacific and Missouri Pacific railroads will be consolidated, with Abraham Gould, brother of Jay Gould, as purchasing agent.

It is reported that the St. Louis Sugar Refinery, one of the largest in America, which has been closed for two years, will resume under a new name when the present duty on raw sugar is taken off next April.

Australia is said to be glutted with enterprising young men who would gladly work for 10 shillings a week and board.

"The outlook for lake transportation business is not so brilliant as it might be," said a Buffalo vessel owner of long experience. "The tonnage is increasing even beyond the great increase in the freights, and it looks as if the competition would be lively among the vessel owners and transportation companies."

Fighting what is known as the Burdick Oil bill, now before the Pennsylvania Legislature, Vice-President Archibald of the Standard Oil Company made a new revelation when he stated that "when the impartial history of this period is written, they (the company) will stand as one of the greatest monuments of American industry. The past few years the most flattering proposals have been made to us to join in with those who are controlling the Russian oil fields. I state this as a fact not known outside our own councils, but we have steadfastly refused to do so, and have stuck loyally to American petroleum. If we had not done so the condition of Pennsylvania petroleum today would have been very different. As it is, we are fighting the Russian bear."

We are expending millions in meeting his competition, and you may know what this is when I say that the greatest banking firm in all the world, the Rothschilds, are behind that movement."

Captain McDougall, inventor of the whaleback steel barges, after a second visit to the Pacific Coast, decides against establishing a shipyard on Puget Sound, but will send out two experimental steamers this spring, one to Puget Sound direct and the other via Europe. Speaking of his project, he says the rate on coal from the Sound to San Francisco is about \$2.50 a ton, but the ships coming from Australia and England for grain are the ones that kill the coal trade for the American boats on that coast.

The Spanish Premier at Madrid gives a detailed account of negotiations said to be in progress for a commercial treaty with the United States.

It is stated that the manufacturers of Germany are taking a strong interest in the preparations for the Columbian Exposition. They are assured that the tariff will interpose no material obstacle to large sales of goods that are exceptionally attractive in character or unique in design.

An extensive soda-ash factory is about starting at South Detroit, where there are ample supplies of salt and limestone, the chief constituents. About 90 per cent. of the soda ash used in this country is imported; the other 10 per cent. is made at Syracuse, N. Y., and the works there are very successful.

In an address before the London Chamber of Commerce Sir Michael Hicks-Beach, president of the Board of Trade, said he believed that before another generation strikes and lockouts would be regarded as barbarous as duels in settling disputes. Tribunals of conciliation, such as the chamber had initiated, were far more effective than Government action.

The superiority of American band saws and wood-working machinery is spoken of in the highest terms by T. H. White of Australia, general manager of a heavily capitalized timber company out there. The saw mill machinery, he says, is the best ever made. His company alone will probably take 20 band mills and the Marianetta Iron Works of Duluth have orders for 27, to be turned out early this year, for all parts of the country. Nearly all the wood-working machinery in use in the Australian colonies comes from the United States.

The Senate of Kansas has notified the country that none of the visionary schemes or acts of repudiation threatened by the Farmers' Alliance majority in the House shall become laws. The resolutions state that wild and visionary schemes cause the withdrawal of capital from the State, making it impossible for the debtor class to renew their mortgages or even to pay the interest accruing thereon.

The official State census of New York, by counties, shows a population of 5,997,653.

The revolutionary movement in Chili is seriously injuring trade, and destroys the hope of an early restoration of the currency on a metallic basis.

The Wisconsin Legislature is almost unanimous against free silver coinage.

Mexicans are expecting to hear from Secretary Blaine on the subject of reciprocity after the adjournment of Congress.

The Haskill oil territory in Western Virginia, comprising 20,000 acres of land, has been sold to the Standard Oil Company for \$750,000, and other large purchases are being made. Morgantown is the center of

the tract. The first run of oil through the new pipe line from West Virginia reached Philadelphia last week. Negotiations are pending and about completed to run a line of oil-carrying steamers from Philadelphia to European ports. When everything is in perfect working order the pipe, which is 8 inches in diameter, will have a capacity of 15,000 barrels a day.

There are on the upper Hudson River 80 ice houses containing about 1,500,000 tons of ice, which is three-fourths of their capacity.

Returns from Alaska indicate a population of about 30,000, of whom 8400 are Esquimaux. The number of whites reported thus far is 4419.

Michigan stands first in the lumber trade. Of the total products of the Northwest last year of 8,664,504,715 feet of lumber Michigan produced 4,055,768,849 feet, or nearly one-half of the entire product of that region.

The cinnabar mines of Llano County, Texas, are said to promise an important development.

Secretary Windom, who had the entire United States Treasury at his control, died in possession of a good name and \$9000 besides.

The British province of New Brunswick is clamorous for reciprocity in lumber.

The Boston boot and shoe manufacturers are elated in prospect of reciprocal trade with Brazil and other South American countries, but want withal that the treaty should be supplemented with adequate transportation facilities and the creation of inter American banking. A meeting in Boston last week was attended by leading men, who advocated these measures. F. F. Emory occupied the chair.

Chicago carpenters will strike April 1 unless the differences between them and the bosses as to wages are adjusted before that date. In the strike of last year there were less than 3000 carpenters in the union. There are now more than 6000 in the body. In addition to this they will have the support of the new and powerful Building Trades Council. It was believed that the action of the National Builders' Association in New York, in adopting a resolution favoring arbitration, would influence Chicago contractors toward that method, but interviews with President Goldie of the Carpenters' and Builders' Association and others since their return from the convention dispel the belief, and now a strike is imminent unless employers or workers recede from their positions.—*Chicago Tribune.*

Oil fields, said to be inexhaustible, are being opened in a region extending 300 miles east and west from Albuquerque, New Mexico.

Strikers on the war path in the Connells-ville coke region, Pa., are making things very uncomfortable, not less for themselves than others. Meanwhile furnacemen are providing themselves with fuel from other sources.

Invaluable quarries of alabaster of every possible hue are said to extend for miles in the foot hills near Canon City, Col.

Twenty-five cargoes of cotton left Galveston for Liverpool last month. An effort is being made to make Galveston the distributing point for most of the foreign freight used in the Western States.

Charles Foster of Ohio succeeds Mr. Windom as Secretary of the Treasury, and the appointment is generally well received, the ultra silver coinage advocates alone excepted, his views being thoroughly in accord with those of the President. Un-

limited silver coinage he pronounces impracticable. At the same time he claims to be a bi-metalist to the extent that he would maintain the ratio of gold and silver, and in this view he will find few dissentients, as he simply recognizes the fact "this is a growing country," and the law in force providing for the coinage of \$54,000,000 per annum does not, in his opinion, go too far.

The center of population in the United States is at a point in Southern Indiana, 20 miles east of Columbus.

A cordage factory in Champaign, Ill., claims to be able to manufacture all the American hemp that can be obtained and that farmers can grow this hemp more profitably than they can raise corn. On the great Snake River farm in Minnesota the average amount required last season was 1½ pounds to the acre. The next harvest in the United States will require about 100,000,000 pounds of twine.

The Maryland Court of Appeals decides that the Baltimore and Ohio Railroad will keep control of the canal, defeating the project for a parallel coal line to tide-water.

Fifteen leading business firms of Chicago have joined Marshall Field & Co. and others in bringing suits to test the constitutionality of the McKinley law.

Plates of iron and steel covered with Japanese lacquer have been received by the Navy Department at Washington, which are said to be non-corrosive.

Since the recent rainfall in California grain is reported as greatly improved, and all the fruit growers are enlarging the area of their orchards and vineyards.

Grievous complaints come from Johnstown, Pa., that a flood trap has been built by the Pennsylvania Railroad, just above the Cambria Iron Works, where a stone arch has been thrown across the Conemaugh, when a suspension bridge or cantilever could have been built just as well.

A striker who made frequent use of the epithet, "scabs," was charged with disorderly conduct at a morocco factory in Lynn, Mass., and sent to jail for four months.

A terrible explosion in the Springhill mines in Nova Scotia last Sunday caused the death of 120 persons, including Manager Swift.

The Coinage Committee's Report.

Representative Wickham of Ohio, chairman of the House Committee on Coinage, on Saturday submitted to the House, by authority of the majority of the committee, an adverse report on the Senate bill for the free coinage of silver.

"Under the present act," the report says, "\$54,000,000 annually are being added to the volume of the currency of the country in the form of Treasury notes for bullion purchase. This largely exceeds the contraction by way of the retirement of national bank notes, and in a period of ten years would, at the same rate, gradually add to the volume of the currency above the amount of the bank notes, should they all be retired, \$360,000,000. The Secretary of the Treasury says that the amount of surplus silver in the world above the amount used in the arts and coinage in all other countries than the United States was, for 1888, 39,500,000 ounces. If this estimate is correct, under the present law there is provision for using the world's surplus, which is all that unlimited coinage could accomplish. The American product in 1888 was 45,000,000 ounces and in 1889 50,000,000 ounces.

"It is said, however, that the demand of the present law does not call for all the

silver surplus, and that there are now 'bearing' the market about 15,000,000 ounces, which are sufficient to keep down the price of silver to its present selling figure. Whether these 15,000,000 ounces are likely to remain a threat to the market or whether they are used by designing persons as a temporary means to depress the price is a matter upon which intelligent persons who have appeared before the committee differ. This can be determined by a continuance of the present policy of buying no more than the 4,500,000 ounces monthly provided for by the existing law.

"If the presence of the 15,000,000 ounces is continued only for the purpose of affecting some change in the legislation, and Congress shall show by its action that it intends no change, this body of silver will be permitted to go its way, and so will no longer depress the market. If, on the other hand, this amount of bullion is in actual excess over the demand, it will be easy at any future time for Congress to provide for its absorption into the volume of the currency. To determine this time is needed.

"The Treasury notes issued under the present law are a legal tender. This is the highest function that could possibly be given to silver under free coinage. So that, under the existing law, subject only to the uncertainty as to the origin and design of the 15,000,000 ounces already referred to, we have provision for the use of all the silver that would be brought to the mints under free coinage, assuming the world's surplus to be as already stated; the money issued has all the legal qualities and purchasing power of coined money, and in addition is confined practically to the American product; so that the United States is out of all the danger so strenuously insisted upon by many persons of the flooding of our market with the silver of the world.

"The present law, at the time of its passage, was declared by many ardent supporters of free coinage to be satisfactory. The conditions are substantially the same as then. There has been no important change in our monetary situation. If the present law, when passed, promised to all intents and purposes the use of the American product, and authorized the issue of money as good for all purposes as coined silver, it is not now evident to the committee wherein it has failed in that promise, nor wherein it is likely in the future to fail to accomplish that desirable end.

"In view of the foregoing, feeling that there is no need at present for further legislation, and at the same time being not unmindful of the fact that this Congress at its last session, upon a direct vote, rejected free coinage of silver provided for in language identical with that in this bill, the committee report adversely upon the bill and recommend that it do not pass."

The *News* of King's Mountain, N. C., claims that nearly \$200,000, including the mineral property, has been subscribed toward building a blast furnace.

The Fort Payne Coal and Iron Company have elected the following board of officers: J. W. Spaulding, president; D. H. Goodell, first vice-president; Henry B. Pierce, second vice-president; W. T. Dunn, secretary; F. H. Tobey, treasurer; T. P. Randall, George S. Smith, J. W. Spaulding, Executive Committee.

It is claimed by a Mahoning Valley manufacturer that when the demands made for lower freights and coke are accorded pig iron can be made in the valley at \$12.

The Iron Age

New York, Thursday, February 26, 1891

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The Crisis in Canada.

Perhaps the people of the United States fail to recognize the full significance of the election pending in Canada. Perhaps they regard it as something of only remote concern to them, a contest engendered by party rivalry, and nothing more. But if the signs are not exceedingly misleading they point to events pregnant with consequences of vital moment, not merely as concerns the dominant party, whichever it may be, but possibly as affecting the permanency of the present form of Government in the British North American provinces, and consequently their loyalty to imperial rule. To expedite coming events, and as we have a right to assume, after due consultation with the imperial authority, the Canadian Premier, Sir John Macdonald, determined to precipitate the parliamentary elections, regularly due a year hence, and at once declare a dissolution. The moment seemed opportune on the part of the Premier, as local disaffection with the national policy was widespread, and rumors of certain negotiations said to have taken place at Washington between prominent Liberals, now pronounced by the Dominion ministry to have been little short of "treason," were calculated to excite alarm.

The question on its face appears to be either the approval at the polls of a system of full reciprocal trade with the United States, in the hope of its ultimate sanction both by the Imperial Government and the Government at Washington, or what the Tory ministry now in power call "fairer reciprocity," meaning freedom of trade in a limited sense, guarded with reference to the rights of Canadian manufacturers. Reciprocity of this kind, which Americans in the New England States pronounce "jug-handled" and utterly impracticable, the home Government is known to approve. These two positions are defended by their adherents respectively with a fervor—animosity, we were about to say—not known hitherto in the history of the Dominion. The Liberals, on their part, declare that full reciprocity alone will meet the grave exigencies in which the Dominion finds itself involved, while the Conservatives, proclaiming their loyalty, profess to see the spectral figure of "annexation" somewhere not very distant in the murky political horizon, and detect "treason" in every scheme. The former practically abandon the protective principle as between the neighboring countries, while the latter will permit no trade discrimination against the interests of the British crown.

Even in a cursory survey of the general subject the question arises at the outset. Would the Imperial Government for a moment entertain overtures from the confederated provinces in North America which contemplate a radical change involving trade discrimination, and possibly the severance of political allegiance in favor of the United States? On the main point Sir Charles Tupper, just arrived from England, as the probable successor of Premier Macdonald, speaks advisedly, beyond a doubt, when he says: "Unrestricted free trade between the United States and Canada is impossible."

Another circumstance, probably of deep intended significance in this connection, is the recent response of the British Government to the application of Newfoundland for its sanction of a proposed convention between the colony and the United States, the decision being that "the convention could not at present be completed," it not being clear "how far the proposed terms might affect other interests of the British colonial empire." The mother country has expended millions of pounds sterling in public works to consolidate her North American possessions, besides fostering confederation, and is about to consummate the work by establishing lines of steamships for a new transcontinental route between Europe and Asia, the whole presenting a scheme for the extension of Empire which will be jealously defended.

Aside from all questions of internal government above referred to, how, after all, are the United States directly interested in the success of either party in the Canadian elections? Premier Macdonald said in a recent speech: "The policy we introduced in 1878 we are going to stand by," indicating clearly enough that aside from "a fairer reciprocity" in the exchange of natural products the Conservatives can have little to offer. Consistently with this view, the *Montreal Gazette*, Ministerial organ, argues: "The abolition of duties between Canada and the United States, and the imposition of the higher duties of the latter country on all articles coming into the commercially-united nations, would compel a large class of Canadian manufacturers to purchase in Pennsylvania and elsewhere in the United States the raw material they now obtain in Great Britain, Belgium, Germany and other places in Europe. This is particularly the case with manufacturers in iron, who would be compelled, under the Liberal policy, to purchase in the United States alone. Indeed, it is not great exaggeration to say that, under unrestricted reciprocity, iron imports from sea, at Montreal, would cease altogether."

Diametrically opposed to these views is Mr. Laurier, leader of the opposition, who said at a great Liberal meeting in Montreal last week that the so-called national policy was "a failure and a fraud;" that Canada was suffering from commercial depression as never before; and the reason is that by restricting the market of Canada production is likewise restricted. It was "all nonsense to say that with an assimilation of tariffs Canadian manufacturers

could not compete with the American." He added, "There were interests peculiar to Canada, and he wanted the Parliament of the Dominion to decide upon them irrespective of England."

It is plain from the utterances of Sir Charles Tupper and others in confidential relations that expectations are indulged that mutual concessions on the part of England and the United States may take place before long, say after the adjournment of Congress, which would not involve discrimination against England. Clearly enough, the way is hedged about with formidable difficulties. Two parties to the transaction must be induced to acquiesce, whatever the terms submitted—namely, the United States and Great Britain—who may prove equally intractable.

The Railroads and the People.

Railroad officials are restive under the attempts of more State legislatures to control their operations and regulate their charges. It is very natural that they should resent interference with what they claim as their prerogatives. Every business man wishes to manage his business in his own way. If that business is one which is recognized as entirely legitimate, and in no way involves moral questions or injury to any one, it would seem only just that those in charge of it should be permitted to decide how it should be conducted and what rates should be made to the people who do business with it. This is the case in all legitimate commercial lines. Manufacturers and merchants can charge for their goods whatever they please, and they are not often accused of being extortionate. Even where they do not have much competition their prices are made with a view to encouraging trade and not checking it. A dry-goods merchant, a grocer or a hardware dealer may double his capital in a year by fortunate purchases at low prices and sales at large profits, or by frequently turning his stock over, but law makers take no cognizance of such performances and do not seek to restrict commercial profits. The business houses in a large trading center may show by their continued expansion that they are doing a very profitable trade and making their proprietors merchant princes, but no legislative inquiry is ever instituted in such cases for the purpose of ascertaining and determining what should be considered a fair profit and regulating prices so that profit could not be exceeded.

But when railroad questions come up it is assumed by the public generally that entirely different principles apply and that their affairs are properly the subject of the most stringent regulations. In his annual report to the stockholders of the Chicago and Alton Railroad Company, President T. B. Blackstone takes up this subject and handles it in the able manner which characterizes all his public utterances. He states the case of the railroads very clearly. After citing the decision of the United States Supreme Court in the Minnesota case, that "if a company is de-

prived of the power of charging reasonable rates for the use of its property, and such deprivation takes place in the absence of an investigation by judicial machinery, it is deprived of the lawful use of its property, and thus, in substance and effect, of the property itself, without due process of law and in violation of the constitution," he says:

"If common carriers were permitted, as all other persons are, to sell their services for what they are worth to the public, or were free, as other persons are, to compete with each other, with no more legal restraint than is imposed upon other classes of persons, railroad earnings, under the natural laws of trade, would soon increase so as to give shareholders revenues which would be equal to the average profits of other business enterprises. This cannot be permitted. To secure to the people the great advantage of railroads over stage coaches and wagons on common roads, they must be protected by law against exorbitant and unreasonable charges for transportation. But railroad shareholders are part of the people. Are they not equally with others entitled to protection? Have they not stronger claims for protection than persons engaged in other business enterprises, by reason of being deprived, by State and Federal laws, of more of their natural rights than others are for the common good? Can any good reason be given for depriving them of a fair participation in the general business prosperity of the country, or for depriving them of the right to profit by participating in common with other classes of persons in the general increase of values of property, when the fact cannot be denied that railroads have done more than all else to increase such values? That railroad shareholders do suffer great loss by reason of such deprivation of rights enjoyed by others is known to all men."

This seems to be a strong presentation of the railroad side. Railroad shareholders are certainly a part of the people, and have a right, in common with other investors in business enterprises, to a fair profit on the money which they have invested. Every railroad thus far constructed in the United States has been of much benefit to the section through which it passes. It is hardly necessary to say that there are to-day vast stretches of country with prosperous towns and thriving farms that would be wild wastes if it had not been for the enterprise of railroad builders, backed up by adventurous capitalists. Yet the shareholders in these very roads have probably been without dividends for years, on account of ruinously low rates made for them by State legislatures or railroad commissions.

It may be possible for President Blackstone and other eminent railroad managers to create a more favorable public sentiment toward railroad interests than now obtains. The inclination to treat these interests harshly is undoubtedly going too far. Communities will suffer worse in the long run by deprivation of all railroad privileges than by the payment of rates a little higher than they believe to be fair. This should be considered if the bankruptcy of important railroad companies is not a matter worthy of very serious consideration. But if President Blackstone and his colleagues in official railroad circles are really desirous of securing a popular reaction in their favor they should set themselves at once to correct a number of trifling matters which are of no special advantage to them, but make any number of shippers hostile.

The work of invoking popular favor must begin with individuals. For instance, it has become a custom with many lines, even most important systems, to correct no errors in overcharges for freight. The overcharges must be paid by the shipper, who is then permitted to file a demand for a refund of the excess, which may or may not be returned to him inside of 12 months. Cases are known in which an error of multiplication was apparent on the bill of lading, but the railroad clerk could not correct it because "it had gone through the books and could only be corrected in the regular way"—that is, by paying the excess and filing a claim for refund. Shippers who are thus treated have no reason to feel friendly toward railroad interests. Again, in the matter of payment for supplies in a reasonable time the railroad companies are very derelict. Too many of them pay when they please. An instance of a flagrant character came to our notice but a few days since. A prominent company staved off payment for supplies obtained last June until the present month, and the reason now bluntly given is that a new manager was anxious to make a good showing of net earnings last year, and therefore paid nothing that he could get out of paying until after the fiscal year closed. Such a manager was certainly not creating a favorable sentiment toward railroad interests.

A peculiar instance of arbitrary interference with other people's business is shown in a recent attempt by a railroad company to advance the freight rate on a manufacturer's raw material, on the plea that he had advantages enabling him to turn out his finished product cheaper than his competitors in the same locality, and the only way in which matters could be evened up for the benefit of the latter was by the method referred to. This is paternalism, but it is not business. Yet it illustrates the peculiar views as to the regulation of the trade of a community which prevail among a type of railroad managers.

Over and over again it has been demonstrated that even the best managed railroads in the country have no definite system to be followed in the adjustment of freight rates, but that such rates are made arbitrarily. At one time there was a free interchange of information among the iron and steel manufacturers of this country regarding economies of production effected by new devices of various kinds, but to-day the publication of such information has been almost stopped, and it may be said that our scientific development suffers in consequence, simply because the railroad companies took such information as a basis of calculations to show that the manufacturers could well afford to pay old rates of freight or advanced rates. When information of this kind was used against them the manufacturers would have been foolish to continue to print it, although it was doing the country a great service by stimulating inventive genius and spurring conservative managers.

We do not sympathize with crusades against railroads, and earnestly deplore the disposition of State legislatures to

cripple railroad interests, but to a great extent the railroad companies have invited the denunciations of that part of the people not directly interested in railroad affairs. Reforms should be instituted wherever shippers are not being properly treated. When that is done the foundations will be properly laid on which to rear a solid structure of favorable public sentiment.

Defeat of the Harrow Combination.

The National Harrow Company have been defeated in their attempt to enforce contracts made by them with a member of the combination, and practically the trust must follow the example of the Harvester Trust. The Clipper Chilled Plow Company of Elmira, N. Y., signed preliminary papers, agreeing to enter the combination, but, subsequently changing their policy, sued for an injunction on the attorney holding the signed papers, to restrain him from delivering them to the National Harrow Company, and went on with their business. The National Association thereupon secured an injunction on the Clipper Chilled Plow Company, restraining them from selling spring-tooth harrows, on the ground that they were being disposed of contrary to the arrangement with the trust and at less prices than those fixed by the latter. The Clipper Company began suit before Judge Walter Lloyd Smith of the New York Supreme Court to secure a dissolution of this injunction. In this they have been successful.

All the manufacturers of float spring-tooth harrows in the country, 20 in number, had agreed not to be directly or indirectly interested in the manufacture or sale of such harrows in the United States—except Montana—for 50 years, except as agents and licensees of the National Harrow Company. Practically, the latter were given absolute power to control the manufacture of and to regulate the prices at which harrows should be sold.

Judge Smith, while admitting that the courts have modified the rule as to contracts in restraint of trade so far as it involves the sale by an individual of his business, coupled with the agreement not to engage in it, holds that the courts have not relaxed the rule "where there was a general combination to engross the market, control prices and prevent competition." He holds that this was a conspiracy indictable at common law, is made criminal by our own statutes, and that this combination must clearly come within its condemnation.

He declines to allow the harrow combination to shield itself under its corporate rights, holding that the contracts entered into are "clearly beyond the power of the defendant corporation as a legal entity, and it is not necessary here to adjudge the corporation illegal in order to annul a contract in excess of corporate power."

A very interesting question, upon which the court expressed some doubt, is covered by the following expression of opinion: "If these contracts were limited to the life of these patents, the argument

should not be dismissed without a serious consideration. But when the parties have assumed to contract for 50 years, beyond the possible life time of any of these patents, it is clear that the Federal law has given no such right to such monopoly." This seems to indicate that it may be questioned whether combinations limited to the life of existing patents could not be upheld.

The decision in this last case, involving trusts formed in restraint of trade emphasizes once more the attitude of the courts toward such organizations. The legal difficulties which beset them have become so numerous and so embarrassing that there is little encouragement to form them. The troubles which have overcome them have even led to serious changes in the *modus operandi* of combinations which it would be hardly just to class with trusts. With the disastrous experience which nearly every manufacturer and trader has had with the ordinary combinations on the one side and the apparent impracticability of maintaining really effective trusts on the other side, it looks as though unbridled competition with all its evils were still to hold sway in our industries.

Correspondence.

The Flood Damages at Johnstown.

To the Editor of the Iron Age.—SIR: A paragraph appeared in your issue of the 19th, which reads: "A flood in Johnstown, on Monday, swept away all the bridges in the city but one, including that of the Cambria Iron Company, and the works were shut down."

Our attention has been drawn to this paragraph by letters from the customers of the Cambria Iron Company, inquiring whether our works were seriously crippled by the flood and the bridges carried away. The fact is that the connections of the Cambria Iron Works with the Pennsylvania Railroad and the City of Johnstown are made by two iron bridges and one very heavy wooden bridge, all of which are standing and have not been injured at all. A temporary bridge belonging to the Cambria Iron Company was carried away, but it has no relation to the business of the works. The Gautier Works were not injured at all. The location is above high-water mark, and there was no water near it. They ran right along without a moment's interruption, except that some of their men live in the low parts of the city and had to go home to attend to their families. The Cambria Works proper were somewhat retarded by high water, but this was only for a day, and the stoppage was only partial.

Your paragraph would lead readers to believe that the bridges of the Cambria Iron Company were carried away, and the stoppage of their works would be a very serious one. This has no foundation, in fact, whatever. They are not isolated, and none of their bridges were carried out, and only a portion of the works were stopped by the flood. The sad experience of the Johnstown people in the flood of '89 has made them a little nervous. The city, however, is building up in a substantial manner, and the lower grounds are being raised so as to be above high-water line. Will you kindly make such corrections as you may deem wise, so that our customers may be advised that we have only had a very slight interruption to the works, and that our communications are intact?

Very respectfully,

JNO. FULTON, Gen'l Manager.
JOHNSTOWN, PA., February 20, 1891.

OBITUARY.

DR. OTTO.

We regret to record the death, at Cologne, on January 26, of Dr. N. Aug. Otto, the inventor of the Otto gas engine. He succumbed after a brief illness. His career exemplifies the success of perseverance and energy paired with skill and ingenuity. Luck often follows pluck, and a false start is not fatal. Mr. Otto started as a commercial traveler, for which duties his great mechanical skill was of little avail. Some circumstances turned his attention to gas engines, where his commercial capacity remained valuable. In 1867 he, in conjunction with Eugene Langen, surprised the engineers who had flocked to the Paris Exhibition with a real practical gas engine, an engine of the vertical type, with flywheels on the top, not uncanny in appearance, but terribly noisy. The noise had to be borne, and was borne—for the new engine became very popular—for nine years, when the "Otto Silent" was presented. That engine has undergone such manifold improvements by the inventor and by Messrs. Crossley that startling innovations and perfections are hardly to be looked for.

The gas engine in its practical career has thus quickly attained maturity. Yet the early history of the gas engine has to go back more than 200 years. It is orthodox to quote Huyghens as the first in the field. The series of originators commences, therefore, with one of the best names of physical science. Among the papers of the great physicist is one dated 1640, on a "Novel Motive Force Derived from Gunpowder and Air." Papin took this idea up in 1688, one year after his classical experiment which initiated the steam engine, but he was not satisfied with the results. Fully a century later Street re-opened researches by bringing out and patenting a motor cylinder with explosion by means of a torch. Many others followed, Lebon, Samuel Brown, Wright, Barnett, Newton, Barsanti and Matteucci, Million and Lenoir and Hugon, who came near producing a practical engine. But Langen and Otto's engine of 1867 was so decidedly superior in the economy of gas consumption that the Lenoir and Hugon engines were at once put out of the field. Otto's gas engine embraced the characteristic features of some of its predecessors—it is rarely otherwise in our days—the compression of Barnett, the cycle of Beau de Rochas, and the free piston and other advantages of Barsanti and Matteucci's engine, which was remarkable in many respects and effected ignition by means of the electric spark. But engineers remain indebted to Dr. Otto for supplying an engine which realized and did what others, who deserve all credit, had been aiming at. We will not here contest the question of priority of invention. It has been fought out many a time, and we believe that no one will grudge Dr. Otto the benefits and comfort which his work and exertions brought him.

He was an honorable man, esteemed by all who knew him, and his invention was not a lucky hit. He was not trained as an engineer, but he made himself one by hard work and study; and his achievements prove his great theoretical knowledge, mechanical dexterity and fertility of resources.

ISAAC FEGELY.

Isaac Fegely, Treasurer of Montgomery County, Pa., died recently at Pottstown. The cause of death was heart affection. Mr. Fegely was born in Berks County on December 25, 1825. In 1862, in connection with the late William D. Evans, he established the Pottstown Car Works. Later he embarked in the iron manufacturing business and was one of the original stock-

holders in the Warwick Iron Company. He was president of the company at the time of his death. He was always closely identified with the business and financial enterprises of Pottstown.

The Illinois Steel Company.

The stockholders of the Illinois Steel Company, at a meeting held last Wednesday, unanimously decided to increase the capital stock of the company from \$25,000,000 to \$50,000,000. This action is necessary, in order that the company may expand their operations and keep pace with the great growth of Chicago and the West. The capital stock of the company from the time of their formation until the recent action was \$25,000,000, which is all in use in the conduct of the business and in extension, leaving the company without the necessary scope of capital for the construction of new plants or enlarging the present works, which the large number of important industries using steel and iron in the manufacture of their product might require. At the present time there is \$17,622,600 in plants, material and cash. There are \$7,200,000 in bonds convertible into stock at the option of the bondholders, and for which purpose an equivalent amount of stock is held in trust. The 5 per cent. dividend recently declared absorbed \$888,130. This, with the \$140,000 held in trust for employees, makes a total of practically \$25,000,000. The new stock has not been issued, and no one knows when it will be. It cannot be put upon the market at less than par, as it would not be legal for the directors of the company to issue or sell stock below par.

The principal plants of the company are now in full operation. The rail mills at South Chicago went into operation Thursday. The Joliet mills have been running full since February 6 on billets, rods and light nails, and the Milwaukee plant is running full, with orders ahead for six months. Realizing that a vast industry such as this company operate cannot stand still, and that it must go ahead or of necessity go backward, the company are conservatively preparing to meet the demands which the many large manufacturing concerns now located in and around Chicago may make upon them. The shipyards, the numerous stove foundries which have recently located in the West, the Washburn-Moen Company and other large enterprises will require vast quantities of material, creating a greatly increased demand, which the company propose to be able to supply.

A new enterprise into which the company propose to embark in the near future is the manufacture of cast-iron pipe of every description. The plant for this purpose will be very probably located at Milwaukee. Experts are now occupied in investigating the methods employed in manufacturing pipe in other localities, and they will probably visit Europe before plans are finally decided upon to ascertain the latest improvements in vogue there. A cast-iron pipe plant has long been needed in the vicinity of Chicago, as an enormous quantity of pipe is used annually. The plant will serve another excellent purpose also, in providing an outlet for more of the pig iron produced by the company. An erroneous report is in circulation that the proposed plant will turn out 400 to 500 tons per day. This is an absurd overstatement, as they do not propose to embark so heavily as that in this new branch of trade.

Ten persons in New York, who imported piece goods to be used as hat trimmings, will receive very large sums in refunded duties under the Edelhoff decision.

CHICAGO PRICES.

The Fluctuations of Bar Iron, Sheet Iron, Cut Nails, Wire Nails and Barb Wire from 1881 to 1891.

(With Supplement.)

In another part of this issue will be found a chart showing the fluctuations in the prices at Chicago of bar iron, sheet iron, nails and barb wire for the past ten years. This chart will have more than a passing interest for our readers, as it shows how remarkably prices have fallen in the West within the decade and also indicates in the plainest manner how prices have been influenced by peculiar circumstances. The chart will no doubt be frequently referred to in the future by manufacturers and merchants who may desire to reinforce their judgment on the course of trade by the experience of the past. The quotations upon which the chart is based are taken from our own market reports and verified by comparison with actual sales books of manufacturers or their agents. It is not claimed, however, that all sales made during the period covered have been made at the prices indicated, as that would be an absurdity. Transactions are always made under special circumstances and there is seldom a fixed price for a staple article. Our quotations represent a fair range of the market, and not the highest nor yet the very lowest prices extant. As numerous readers may desire information in tabular form in addition to its graphic presentation in the chart, the quotations have been averaged monthly and will be found below. In this case the fluctuations are not so closely followed as in the chart, which indicates changes from week to week. All prices are for carload lots, f.o.b. Chicago. The bar iron quoted is common merchant iron; the sheet iron is No. 27 common black; the nails are as indicated in the captions over the columns; the barb wire is painted four-point. Prices are per pound throughout, except nails, which are quoted, as is customary, per keg of 100 pounds:

1881.

	Bar iron.	Sheet iron.	Iron nails.	Barb wire.
	Cts.	Cts.	Dolls.	Cts.
January.....	2.40	4.30	2.90	8.
February.....	2.40	4.30	2.90	8.
March.....	2.40	4.30	3.00	8.
April.....	2.35	4.30	3.05	8.
May.....	2.30	4.30	2.90	8.
June.....	2.30	4.30	2.90	8.
July.....	2.40	4.40	2.90	8.
August.....	2.55	4.60	2.95	8.
September.....	2.70	4.80	3.00	8.
October.....	2.90	5.00	3.30	8.
November.....	2.90	5.00	3.30	8.
December.....	2.90	5.00	3.30	8.
Average for year.....	2.85	4.55	3.03	8.

1882.

	Bar iron.	Sheet iron.	Iron nails.	Barb wire.
	Cts.	Cts.	Dolls.	Cts.
January.....	2.90	5.00	3.40	8.
February.....	2.90	5.00	3.40	8.
March.....	2.90	5.00	3.40	8.
April.....	2.75	4.90	3.40	8.
May.....	2.60	4.80	3.30	8.
June.....	2.90	5.00	3.65	8.
July.....	2.85	5.00	3.75	8.
August.....	2.75	5.00	3.90	8.
September.....	2.75	5.00	3.90	8.
October.....	2.70	5.00	3.80	8.
November.....	2.65	5.00	3.65	8.
December.....	2.50	4.90	3.65	7.87½
Average for year.....	2.76	4.96	3.60	8.

1883.

	Bar iron.	Sheet iron.	Iron nails.	Barb wire.
	Cts.	Cts.	Dolls.	Cts.
January.....	2.40	4.80	3.50	7.87½
February.....	2.35	4.55	3.40	7.87½
March.....	2.30	4.40	3.30	7.37½
April.....	2.20	4.40	3.25	7.37½
May.....	2.10	4.30	3.20	6.37½
June.....	2.10	4.20	3.15	6.12½
July.....	2.05	4.00	3.05	6.00
August.....	2.05	4.00	3.05	5.75
September.....	2.00	4.00	2.90	5.50
October.....	2.00	3.80	2.85	5.00
November.....	1.85	3.60	2.75	5.00
December.....	1.80	3.50	2.55	3.00
Average for year.....	2.08	4.10	3.08	6.27

1884.

	Bar iron.	Sheet iron.	Iron nails.	Barb wire.
	Cts.	Cts.	Dolls.	Cts.
January.....	1.80	3.15	2.50	5.00
February.....	1.82½	3.15	2.65	4.62½
March.....	1.82½	3.15	2.55	4.62½
April.....	1.77½	3.20	2.47½	5.00
May.....	1.82½	3.15	2.45	5.00
June.....	1.72½	3.15	2.40	5.00
July.....	1.77½	3.07½	2.30	4.75
August.....	1.80	3.00	2.22½	4.25
September.....	1.70	3.00	2.15	4.25
October.....	1.60	2.95	2.10	4.15
November.....	1.60	2.90	2.10	3.90
December.....	1.55	2.85	2.07½	3.75
Average for year.....	1.73	3.06	2.33	4.52½

The course of prices in 1884 is worthy of special remark. In this year a panic occurred in May in railroad securities, which speedily affected all branches of business. The demand for iron products experienced a decided shrinkage and prices receded to lower depths than had before been known at Chicago. There was a steady decline until the close of the year. At that time old iron rails were abundant and very cheap and were largely used in the manufacture of common iron. It will be noted further that sheet iron and nails fell in price in about the same ratio as bar iron. This year marked the first appearance of cut steel nails as a regular commercial product, although they had been manufactured in a small way in 1883 by several factories. They were sold at 10 to 15 cents per keg above the price of iron nails. Their use in the West increased very rapidly from 1884, and in 1887 they almost wholly supplanted iron cut nails. The reduction in the price of barb wire was very marked in 1884, due to the competition of wire upon which no royalty was paid to the patentees.

1885.

	Bar iron.	Sheet iron.	Iron nails.	Barb wire.
	Cts.	Cts.	Dolls.	Cts.
January.....	1.57½	2.90	2.07½	3.37½
February.....	1.60	2.90	2.25	3.62½
March.....	1.60	2.90	2.25	3.75
April.....	1.60	2.90	2.20	3.75
May.....	1.60	2.80	2.10	3.37½
June.....	1.67½	2.90	2.15	3.37½
July.....	1.67½	2.90	2.27½	3.50
August.....	1.65	2.95	2.20	3.40
September.....	1.57½	3.00	2.35	3.50
October.....	1.60	3.00	2.87½	3.25
November.....	1.60	3.00	3.20	3.20
December.....	1.57½	3.00	2.62½	3.75
Average for year.....	1.61	2.93	2.38	3.49

The year 1885 was a period of gradual recovery from the depression of 1884. It was particularly marked by a strike among Western nailmakers, which caused a scarcity of nails for a time, resulting in a rapid advance in their price. In 1885 the wire nail secured a foothold in the trade, but it was not until 1886 that regular quotations were made. In 1886 and 1887 jobbers carried full stocks of three kinds of nails—iron and steel cut nails and wire nails.

1886.

	Bar iron.	Sheet iron.	Iron nails.	Barb wire.	Wire nails.
	Cts.	Cts.	Dolls.	Cts.	Dolls.
January.....	1.65	2.90	2.40	3.90	.....
February.....	1.65	2.80	2.40	3.85	.....
March.....	1.70	2.90	2.40	3.75	.....
April.....	1.65	2.80	2.32½	3.90	.....
May.....	1.55	2.75	2.10	3.50	.....
June.....	1.55	2.80	2.00	3.50	.....
July.....	1.55	2.77½	2.05	3.42½	.....
August.....	1.57½	2.80	2.00	3.05	.....
September.....	1.65	2.80	2.02½	3.00	3.50
October.....	1.65	2.80	2.12½	3.00	3.50
November.....	1.70	2.80	2.10	3.00	3.55
December.....	2.00	2.90	2.25	3.05	3.80
Average for year.....	1.66	2.82	2.18	3.41	3.51

1887.

	Bar iron.	Sheet iron.	Iron nails.	Barb wire.	Wire nails.
	Cts.	Cts.	Dolls.	Cts.	Dolls.
January.....	2.15	3.00	2.45	3.35	3.50
February.....	2.15	3.05	2.55	3.70	3.65
March.....	2.15	3.10	2.52½	3.60	3.65
April.....	2.10	3.10	2.40	3.50	3.45
May.....	2.00	3.10	2.15	3.40	3.20
June.....	1.90	3.05	2.07½	3.30	3.00
July.....	1.92½	2.90	2.10	3.25	2.95
August.....	1.95	2.95	2.05	3.27½	3.00
September.....	1.95	3.12½	2.02½	3.25	3.00
October.....	1.90	3.10	2.00	3.22½	2.90
November.....	1.85	3.10	2.02½	3.20	2.75
December.....	1.80	3.05	2.07½	3.17½	2.75
Average for year.....	2.00	3.06	2.20	3.35	3.15

*Steel cut nails.

In November, 1887, the quotation of iron cut nails was dropped in the Chicago market reports, and steel cut nails were thereafter regularly quoted.

1888.

	Bar iron.	Sheet iron.	Steel nails.	Barb wire.	Wire nails.
	Cts.	Cts.	Dolls.	Cts.	Dolls.
January.....	1.75	3.05	2.05	3.25	2.70
February.....	1.72	3.00	2.05	3.10	2.60
March.....	1.70	3.00	2.15	3.15	2.65
April.....	1.70	2.95	2.05	3.12½	2.70
May.....	1.62½	2.85	1.95	3.05	2.60
June.....	1.60	2.85	1.95	3.00	2.50
July.....	1.60	2.90	1.85	3.00	2.35
August.....	1.65	2.95	1.90	2.90	2.45
September.....	1.75	3.15	1.95	2.80	2.55
October.....	1.75	3.10	1.90	2.75	2.55
November.....	1.72½	3.10	1.80	2.75	2.55
December.....	1.72½	3.05	1.90	2.75	2.40
Average for year.....	1.69	3.00	1.90	2.97	2.55

1889.

	Bar iron.	Sheet iron.	Steel nails.	Barb wire.	Wire nails.
	Cts.	Cts.	Dolls.	Cts.	Dolls.
January.....	1.70	3.05	1.95	2.80	2.55
February.....	1.67½	3.05	2.00	2.75	2.40
March.....	1.62½	3.00	1.95	2.70	2.35
April.....	1.60	3.05	1.95	2.70	2.35
May.....	1.55	2.95	1.90	2.65	2.30
June.....	1.55	3.00	1.85	2.65	2.30
July.....	1.60	3.12	1.85	2.65	2.30
August.....	1.65	3.17	1.85	2.65	2.25
September.....	1.70	3.20	2.00	2.75	2.35
October.....	1.75	3.30	2.40	3.05	2.55
November.....	1.85	3.30	2.40	3.15	2.55
December.....	1.82½	3.30	2.52½	3.25	3.00
Average for year.....	1.68	3.21	2.05	2.81	2.49

1890.

	Bar iron.	Sheet iron.	Steel nails.	Barb wire.	Wire nails.
	Cts.	Cts.	Dolls.	Cts.	Dolls.
January.....	1.85	3.30	2.50	3.25	2.90
February.....	1.90	3.30	2.40	3.35	2.95
March.....	1.80	3.20	2.30	3.30	2.75
April.....	1.75	3.10	2.10	3.15	2.40
May.....	1.70	3.00	1.85	2.90	2.30
June.....	1.80	3.15	1.95	2.85	2.40
July.....	1.80	3.15	2.00	2.85	2.40
August.....	1.85	3.25	2.00	2.85	2.50
September.....	1.90	3.25	1.95	2.85	2.55
October.....	1.85	3.20	1.95	2.85	2.40
November.....	1.80	3.15	1.85	2.75	2.30
December.....	1.77½	3.05	1.75	2.70	2.25
Average for year.....	1.82	3.17	2.05	2.97	2.52

Collecting the average prices for each of the years covered in the foregoing tables, and adding for the purpose of comparison the average prices for the month of January, 1891, we have the following comprehensive exhibit for the decade:

	Bar iron.	Sheet iron.	Cut nails.	Barb wire.	Wire nails.
	Cts.	Cts.	Dolls.	Cts.	Dolls.
1881.....	55	4.55	3.63	8.00	.....
1882.....	76	4.96	3.60	8.00	.....
1883.....	12.08	4.10	3.08	6.27	.....
1884.....	1.75	3.06	2.33	4.52	.....
1885.....	1.61	2.93	2.38	3.49	.....
1886.....	1.66	2.82	2.18	3.41	3.51
1887.....	2.00	3.05	2.20	3.35	3.15
1888.....	1.69	3.00	1.96	2.97	3.55
1889.....	1.68	3.21	2.05	2.81	4.49
1890.....	1.82	3.17	2.05	2.97	5.52
January, 1891.....	1.70	2.95	1.75	2.70	32.76

It will be seen from this table that 1882 was the year of highest prices in the decade. Present prices are below the average, and those of cut nails, barb wire and wire nails are the lowest recorded.

MANUFACTURING.

Iron and Steel.

All the employees at the blast furnace at New Castle, Pa., have accepted a reduction of 15 cents per day on 12-hour work and 10 cents per day on 10-hour work. It is stated that notwithstanding this reduction they receive 25 cents per day more than is paid for similar work in the Mahoning Valley, Ohio.

The Westerman Natural Gas and Iron Company are building a rolling mill at Marion, Ind., which is expected to be ready to start about the middle of March. It will be a scrap mill of 50 tons daily capacity. Every care is being taken to make the plant one of the most complete in the country for the manufacture of special irons. The company will use the Westerman Patent Pile, which secures a great saving in time and labor, and with natural gas for fuel they are confident that their output will be of high grade. Special attention will be given to the manufacture of horseshoe bar, screw iron, rivet iron, carriage axle iron, &c. They have issued a price-list, setting forth the special sizes and shapes which they propose to manufacture. Their principal office is at Marion, Ind., but they will maintain an Eastern office in Buffalo, N. Y. George L. Mason is president, George Westerman, Sr., is vice-president and general manager; M. F. Blaine is secretary and treasurer.

The Springfield Steel Casting Company, Springfield, Ohio, although making but one heat every day seven months ago, are now running three heats daily, nearly the limit of their present capacity. Their specialty is soft, medium and hard steel castings for machine shop use. The company will as soon as weather permits erect additional buildings and furnaces, doubling their present capacity. The company own 3 acres of ground and possess ample shipping facilities, being connected by switch with every railroad line entering Springfield.

It is reported at New Castle, Va., that A. E. Humphreys, president of the New Castle Development Company, has recently purchased the Bettie Iron Furnace, at Spring Hill, W. Va., from the Black Band Mining and Mfg. Company, and will move it to New Castle.

The Ohio Development Company of Florence, Ala., are in negotiation with Ohio capitalists, looking to the establishment at Florence of a rolling mill and iron works.

The Southern Rolling Mill at Avondale, Ala., is shortly to increase its capacity by the addition of ten more puddling furnaces.

Adams & Marriott have made the citizens of San Antonio, Texas, a proposition looking to the establishment of a rolling mill in that place. The citizens are asked to subscribe \$55,000.

The Lady Ensley Coal, Iron and Railway Company is the name of the new company at Sheffield, Ala., who have recently consolidated the furnaces at Sheffield, the ore mines at Russellville and the Horse Creek Coal and Coke Company at Horse Creek. The president of the new concern is Enoch Ensley of Memphis, Tenn.; Walter Moore of Horse Creek, Ala.,

general manager, and T. D. Radcliffe, secretary. The company are capitalized at \$3,000,000.

The first steel nails ever manufactured in the South by the Gleason machine were recently turned out at Fort Payne, Ala., by the Fort Payne Rolling Mill.

The furnace at Tallapoosa, Ga., went out of blast just before Christmas and is still idle, though it is believed it will shortly resume operations, now that the coal and coke supply is replenished.

J. W. Womeldorf of Cincinnati, Ohio, and J. J. Bright of Pt. Pleasant, Ohio, are preparing to build a rolling mill plant at Salem, Va. This plant will comprise a muck bar mill, with from 12 to 25 furnaces, and a large rolling mill. The entire plant will employ about 300 men. The old plant was formerly located at Newport, Ky., and was owned by the officers of the old Fidelity Bank of Cincinnati.

There is no foundation for the statement published in some quarters that the Reading Iron Company of Reading, Pa., contemplate the removal of any of that company's plants or the establishment of any branches in the South, nor have they authorized any one to make negotiation for the purchase of land for such purpose, as has been stated.

The rail mill of the Bethlehem Iron Company, Bethlehem, Pa., is working on an order for 70-pound T rails for the Norfolk and Western Railroad.

The new rolling mill of the Kilmer Mfg. Company, at Newburg, N. Y., was put in operation on the 16th inst.

P. Cunningham of Scotland, who has been engaged by Sir Edgar Watts of the Watts Steel and Iron Syndicate to superintend the work of building a steel plant at Middlesbrough, Ky., has arrived in this country.

The new charcoal furnace of the Lone Star Iron Company, at Jefferson, Marion County, Texas, is making preparations to blow in.

Rome Furnace, a new charcoal stack at Rome, Ga., will probably be lighted during March.

The work of repairing the Pulaski (Va.) Furnace, which was recently banked owing to an explosion, is progressing rapidly, and the furnace is expected to start up within a few days.

The Ashtabula (Ohio) *Beacon* gives the following interesting calculations in connection with the 2,176,730 tons of iron ore received at that port during the past year: "The transportation of this mountain of ore to the interior furnaces would require 108,836 cars, carrying 20 tons each, making 4353 trains of 25 cars each. Counting 6 trains of 25 cars each to the mile, the total length of the 4353 trains would be 725 miles. If the railways worked 300 days in the year they would have to haul 14½ trains every day."

The puddlers in the employ of the Belmont Nail Company, at Wheeling, W. Va., have gone out on strike on account of the refusal of the firm to sign the Amalgamated Association scale. As yet there are no signs of a settlement of the difficulty.

The Bessemer Rolling Mill Company, at Bessemer, Ala., are preparing to recommence operations at their mill shortly.

The president of the Brilliant Iron and Steel Company, at Brilliant, Ohio, has made a proposition to the authorities of that city that if councils will give the company half of a street close to their present plant the firm will erect a sheet and bar mill in addition to the present plant, and thereby make it possible to increase the force of workmen to 500 or more men.

At Pittsburgh last week arguments were heard in the case of the appeal from the appraisal of the interest of the late Captain K. C. Gray in the firm of Park Brothers & Co., Limited, proprietors of the Black Diamond Steel Works, in that city. The appraisal was made by James Lindsay, on the petition of the surviving members of the firm, who are the executors of Captain Gray's will, and who desire to purchase from the heirs his interest in the firm. Mr. Lindsay appraised the interest at \$450,844, or 838 shares of the stock at \$538 per share. The matter of the earnings of the stock was left for the court to decide on a basis submitted by the appraiser. Exceptions to the appraisal were filed by the surviving partners, who maintained that the amount allowed was excessive. As yet no decision has been rendered in the case.

The recently-inaugurated Albany Construction Works, Albany, N. Y., are full of orders. They manufacture all kinds of iron work for buildings and all sorts of forgings, castings and patterns. They have facilities for a complete line of machinery moldings, and make a

specialty of artistic iron work. The firm is composed of Thomas J. Dowling, recently foreman at Jas. McKinley & Sons' Architectural Iron Works, and Harry E. Campbell.

No. 2 puddle mill of the Enterprise Iron Works of Cartwright, McCurdy & Co., at Youngstown, Ohio, was destroyed by fire on Thursday, the 19th inst. It will be rebuilt at once.

The Troy Steel and Iron Company, Troy, N. Y., have started a fire in Blast Furnace No. 1 on Breaker Island. The company now have two furnaces running, and will hold a third in reserve.

Woods' foundry at Troy, N. Y., caught fire in the cupola, February 14, and was damaged to the extent of \$100 before the flames were extinguished.

The work of clearing away the ruins of Dix & Co.'s molding shop at Glens Falls, N. Y., has been begun. They will erect a new building on the old site. The old plant was recently destroyed by fire.

The Aetna Furnace, near Anniston, Ala., has recently resumed operations.

There seem to be well-grounded reports among the Alabama furnaces of a disposition of consumers both North and West to take advantage of the low prices of Southern irons. Several buyers in the vicinity of Pittsburgh have recently placed orders with Southern furnaces. It is understood that an order was recently placed for No. 2 Southern Foundry at \$16.15, cash, on cars, Pittsburgh. This was Lady Ensley Iron from Sheffield, Ala.

The cyclone that recently passed in a southeasterly direction through Talladega County, Ala., did considerable damage to the Talladega Iron and Steel Company's furnace plant at Talladega, blowing the roof entirely off of the cast house and doing other injuries. The furnace, however, will soon be running again.

The Etna Iron Company, H. D. Hamilton, president, Etna, Polk County, Ga., are establishing an "American Pig Iron Storage Warrant Company Yard" at their furnace. They make a superior charcoal car-wheel iron, which has an excellent reputation.

The Anniston Pipe Works, Anniston, Ala., of which Walter Crafts was recently appointed receiver, are settling up their affairs, and will either be run under the receivership or by some new parties, whom it is understood are negotiating for the plant. It probably will not remain idle long.

On February 18 the stockholders' meeting of the Fort Payne Coal and Iron Company was held at Rice Opera House, Fort Payne, Ala., when it was agreed to bond the company's property for \$300,000. The bonds are to be issued in a series of from 1 to 1550 inclusive, amounts of \$5000 and under, run ten years, at 8 per cent., payable semi-annually at the Old Colony Trust Company's office in Boston. There was represented 42,074 shares, of which W. P. Rice controlled 22,400, thus giving him the majority of the stock. A temporary loan of \$20,000 was asked of the stockholders, using bonds of the company as collateral. This sum was raised in amounts of \$5000 and under during the meeting. Following this meeting there was held the stockholders' meeting of the Fort Wayne Furnace Company, and new directors were elected as follows: E. W. Freeman, Dr. J. M. Ford, G. E. Russell, P. A. Soule, W. A. Janks, C. S. Abbott, T. C. Hathaway. Mr. Freeman tendered his resignation and Ralph Gordon was elected his successor *pro tem*. It was decided to issue bonds on the property not to exceed \$100,000. The following officers were elected: Dr. J. M. Ford, president; G. E. Russell, general manager; S. C. Hathaway, Jr., secretary and treasurer.

It is reported upon reliable authority that the majority of the Alabama coke furnaces have orders already booked, together with existing old contracts, that will keep them busy for several months to come, one company having sold 80,000 tons and another 40,000, and there is quite a decided stiffening in prices by the furnaces, it having been agreed by the furnaces in the Birmingham District, at a meeting held by them last week, to advance prices 25 cents per ton. The coke furnaces now out of blast in the Birmingham district are one Sloss, one Alice, one Ensley City, one Trussville, one Mary Pratt, 2 DeBardeleben, 1 Oxmoor. The two new DeBardeleben furnaces at Bessemer which went out of blast during the strike have been undergoing a change, 1 foot being added to the height of each. The work upon one is nearly completed, and this furnace will go into blast inside of 30 days.

It is understood that A. M. Shook, general manager of the South Iron Company, who recently superseded Judge H. G. Bond as general manager for Alabama of the Tennessee Coal

Iron and Railway Company, will still continue as the manager of the first-named company. H. G. Bond will attend personally to the development of large holdings in Washington Territory.

Machinery.

A New York safety engine has been put in the Genesee Laundry at Le Roy, N. Y. It was purchased at Rochester.

It is stated that the Chesapeake and Ohio Railroad Company will establish at Russell, Ky., a machine shop and iron foundry that will cost \$250,000.

The Excelsior Machinery Company have been incorporated at Covington, Ky., by S. H. Shadbolt, C. B. Houghton, J. R. Bate and others, to manufacture the rotary reciprocity machine, Excelsior machinery, &c. The company have a capital stock of \$50,000.

New and improved machinery is being added to the plant of the Alamo Iron Works, at San Antonio, Texas.

Efforts are being made at Richmond, Va., to organize the Dowe Press and Machine Company, for the purpose of manufacturing cylinder and job presses, paper cutters and printing machinery generally. The proposed company are to have \$250,000 capital stock.

C. A. Hege & Co., proprietors of the Salem Iron Works at Salem, N. C., are organizing a company to operate that plant. They contemplate doubling the capacity of their works with a view of paying particular attention to the manufacture of engines.

The new iron foundry of Houston, Stanwood & Co., at Covington, Ky., has commenced work. This concern manufacture the Standard slide valve engine.

New machinery will be added shortly to the Lead Hill Foundry and Machine Shops at Lead Hill, Ark.

The foundry of the Wilkin Mfg. Company, at Milwaukee, Wis., was burned on the night of the 12th inst., destroying many of the patterns for engine and other work. This will delay some orders which were on hand, but will not interfere much with their general business. The loss on building and patterns is about \$20,000. The company will rebuild at once.

At Hornellsville, N. Y., the St. Julian Gear Works will soon take possession of the storehouse of Stephen Holland on Cass street, opposite their present plant. It is reported that they will make it a plant to manufacture wire fence under the Rushel patent.

The Buffalo Refrigerating Machine Company will place a \$12,000 machine in the extensive cellar of the Nebraska Wine Company at Bath, N. Y., before May 1. The machine will turn out 20 tons of ice a day.

The foundry building of the Wilkin Mfg. Company, at Bay View, Wis., has been burned at a loss of \$5000, covered by insurance.

The machinery and building of the Barnett Brass Works, Mansfield, Ohio, were recently damaged by fire to the extent of \$12,000.

The Chicago Foundry Supply Mfg. Company of Chicago, Ill., will construct a facing mill 300 x 70 feet, to cost \$50,000.

The Huyett & Smith Mfg. Company of Detroit, Mich., will build a two-story brick addition, 200 x 50 feet, to be used for the construction of hand blowers.

The iron foundry of J. J. Lacey & Co. at Baltimore, Md., was destroyed by fire several days ago, at a loss of about \$50,000.

The Richmond Locomotive Works Company of Richmond, Va., are rebuilding the boiler shop recently destroyed by fire.

The Golden Foundry and Machine Works, Columbus, Ga., are about completed, and are well equipped with modern machinery.

Hardware.

The Ohio Rake Company, Dayton, Ohio, have increased their capital stock from \$100,000 to \$300,000.

The Chinese Stove Polish Company were recently incorporated at Centralia, Ill. with a capital stock of \$15,000, to manufacture and sell a stove polish invented by E. F. Zarbock, a stove dealer of that town. This polish has been on the market for two years, and, although no great efforts were made to introduce it, the sale has been large. It is claimed for this polish that it will not burn off, is easy to polish and has neither odor nor dust.

A company with \$350,000 capital stock is being organized at Roanoke, Va., to manufacture hardware.

The Hawkins Nail Puller Company of Terre Haute, Ind., find it necessary to work overtime to supply the demand for their goods. Although this tool has been on the market but

a short time it has had a wide sale, and the capacity of the works is shortly to be increased.

It is announced that the Iowa Barb Wire Works will shortly erect an annex to their plant at Allentown, Pa. The addition will be 100 x 160 feet, of brick, and will be built to the west end of the barb mill, which will then be 100 x 300 feet, making it the largest establishment of its kind in the world.

The Foster Mfg. Company's works at Florence, Ala., have been purchased by W. P. Campbell, who will organize a stock company to operate the plant.

The Columbus Mfg. Company, Columbus, Ohio, are now manufacturing about 50 dozen of their Columbus Diggers per day. They advise us that they name a special price to car-load buyers.

Washburn & Moen Mfg. Company, Worcester, Mass., advise us that they have decided to duplicate a part of their works at Waukegan, Ill., their preference for that location having been determined largely by the following facts: It is the terminus of a belt road which gives free access to all the other railroads running in or out of Chicago, and thus insures practically Chicago rates to all points; that Waukegan is unsurpassed for salubrity and is exempt from miasma, the wharf and harbor facilities being also good; highly convenient and economical natural division of the site into "Lake-shore" and "Bluff," affording every facility for loading and unloading, with as little handling as possible; cheap and unlimited supply of pure water without pumping; cheap access to coal and iron of best quality; unlimited territory for the location of homes for the workmen, with good sewerage. The location has been rendered the more attractive from the fact that it brings the company somewhat nearer than even Chicago itself to the great Northwest, where they have had for more than half a century a constantly increasing clientage.

The copartnership heretofore existing under the firm name of Austin, Soule & Brazier, Milwaukee, Wis., has been dissolved, William H. Brazier retiring. The business of the firm will be continued by the Austin, Soule & Barnett Company with increased capital, tools and facilities. The officers of the new corporation are as follows: C. E. Bleyer president, Geo. F. Soule vice-president, E. P. Barnett secretary and treasurer, and L. W. Austin superintendent. The company will manufacture tacks, wire nails, wire and hardware specialties of all kinds.

Miscellaneous.

A company with a capital stock of \$2,000,000 were recently organized at Lynchburg, Va., for the purpose of developing "The Narrows" in Giles County, Va. M. B. McIlwain of Petersburg, Va., was elected president; W. A. French vice-president, with the following directors: D. A. French, A. R. Hefflin, D. E. Johnston, Robert M. Wilkinson, James E. Heath, M. Thalhimer, F. G. Walker, S. W. Williams, W. P. McIlwain, W. M. Jones and W. A. French. The company will develop mineral resources that exist near "The Narrows."

The Atlas Iron Construction Company have filed articles of incorporation at Albany, N. Y. The company are organized with a capital stock of \$50,000 to manufacture iron and metal work in New York and New Jersey.

J. A. Day & Co., Cincinnati, Ohio, report the sale of one of their 240 ton per day sand dryers to the Sheridan White Sand Company of Sheridan, Ill. The one they made for the Garden City Sand Company is now in operation. Both of the large dryers use oil for fuel.

W. J. Clark & Co. of Salem, Ohio, have recently made for Samuel Carey of 17 Broadway, New York, some quite novel shaped buckets for a new kind of elevator for handling coal. The buckets have no back—the leg of the elevator is made to serve as a back, the buckets being held firmly against the back of the leg while they are being drawn up with their load. Near the top of the front leg of the elevator is an opening in its back, through which the coal slips out of the buckets as they pass upward, thus delivering the coal into bins or conveyor without breaking it so much as it is broken when thrown from the buckets as the pass over the pulley at the top of the elevator in the usual way.

The annual meeting of the stockholders of the Pittsburg Development Company was held recently at Roanoke, Va., and the name of the company was changed to the Elliston Development Company, and the following officers were elected: George E. Jenkins, president; M. T. C. Jordan, vice-president; with the following directors: George E. Jenkins, M. T. C. Jordan, J. R. Johnston, A. J. Dyerle, John Fitz, W. M. Ellis, Joseph F. Campbell, Samuel A. Metz-

ler. The report presented by the president showed that the company had made 97 cents for every \$2 paid in, and that the excess of assets over liabilities amounted to \$87,283.28. The headquarters of the company has been removed from Roanoke, Va., to Elliston.

It is stated that Nelson Tift, at Tifton, Ga., is negotiating with parties for the establishment of car works in that place.

The Richmond Agricultural Implement Company, with a capital stock of \$25,000, have been incorporated at Richmond, Va. H. W. Claiborne is president; G. W. Brown, vice-president; D. C. Kennedy, secretary and treasurer; and H. L. Smith, general manager. The Board of Directors, in addition to the above, are D. J. Baldwin, B. Brill, Jr., and J. T. Dunn, all of Richmond. General Manager Smith was for years the Virginia and North Carolina representative of William Deering & Co., and Secretary and Treasurer Kennedy was for many years manager of the agricultural department of Baldwin & Brown.

It is stated that negotiations are pending between Michigan parties and the Board of Trade of Clarksville, Tenn., looking to the removal of an agricultural implement works to Clarksville.

The Phillipsburg Land and Improvement Company have been organized at Crossville, Tenn., with Noble Phillips of Hoosier, N. Y., as president; W. R. Adams of New York, vice-president, and R. W. Shannon of Albany, N. Y., secretary. This company will develop a tract of mineral land recently purchased by them and will establish the manufacturing town of Phillipsburg.

The Chattahoochee Land Company have been incorporated at Atlanta, Ga., with a capital stock of \$3,000,000. The incorporators are E. Eastman, J. D. Collins, P. H. Harralson and others. The company will purchase 1500 acres of land in the vicinity of Atlanta, and will establish a manufacturing town and locate a number of industries.

The Lake View Mining and Mfg. Company, with a capital stock of \$50,000, have been organized at Birmingham, Ala., by E. J. and T. S. Thomason of Knoxville, Tenn., for the purpose of operating mines and establishing manufacturing enterprises.

Work on the plant of the Basic City Car Works, at Basic City, Va., is progressing rapidly. The boilers were placed in position last week and tested, the cupolas lined, and the plant will shortly be ready to commence operations.

The King's Mountain Mining, Mfg. and Improvement Company are reported organized at King's Mountain, N. C., for the purpose of developing iron mines in that vicinity. The incorporators of the company are W. A. Marney, A. R. Rudasil, F. Dilling and others.

It is stated that an English syndicate has purchased two valuable plantations on the Catawba River near Winnsboro, S. C., and are organizing the South Carolina Land Development Syndicate for the purpose of building a new manufacturing town and the development of the water power of the Catawba Falls. The new corporation contemplate the establishment of a number of manufacturing industries.

A company has been formed at Anniston, Ala., with a capital stock of \$100,000, to manufacture and sell the Harless Car Door. J. D. Harless is president of the company; L. Zingsheimer of Birmingham, Ala., is vice-president; John B. Knox, attorney.

The receiver of the United States Rolling Stock Company of Anniston, Ala., has filed a report showing that he issued certificates aggregating \$474,610 in settlement of promissory notes and open accounts. Permission was granted to accept \$18,986 in notes payable in six months in settlement of an indebtedness of the Union Pacific Railroad Company. The receiver will soon begin suit on an unpaid overdue note for \$9597, made by the defunct Decatur and Nashville Improvement Company, and endorsed by John S. Silver, the latter being made the defendant in the suit.

D. W. Sherman has purchased of James N. Guroo of Glen's Falls, N. Y., the machinery formerly contained in the Novelty Works, at that place. Mr. Sherman will utilize it in his new steam planing mill.

The Birdsall Company of Auburn, N. Y., resumed operations last week with large sales for this season of the year in threshers and agricultural implements. As soon as possible a full force of men will be put on.

The persistent refusal of the Baltimore and Ohio and the Pennsylvania Railroad companies to grant to Wheeling, W. Va., the same rate on coke as Pittsburgh now enjoys has resulted in the development of a scheme for an inde-

pendent line to Connellsville. A number of the leading iron men of Wheeling, as well as outside capitalists, have taken the preliminary steps for a line straight from Wheeling to Connellsville, a short branch connecting the main line with the Monongahela coal fields of West Virginia. It is authoritatively asserted that such a scheme is on foot, and that surveys show a possible road to Chicago 150 miles shorter than any existing line. Wheeling now pays \$1 more a car for coke than Pittsburgh, although the former is considerably nearer to Connellsville.

The new plant of the Bessemer Pipe Works at Bessemer, Ala., will soon commence operations.

It is stated that negotiations are pending at Anniston, Ala., with the Seaton Mfg. Company of Cleveland, Ohio, for the purpose of removing the bolt and nut works of that company to Anniston.

The Norwood Car Replacer Company will soon erect a malleable iron works at Baltimore, Md. The plans for the factory buildings have been prepared and estimates are now being received on the furnaces, cranes, cupolas and other necessary parts of the plant. A local company with a capital stock of \$100,000 will be formed, with W. C. Codd as president and H. C. Thomas as secretary.

It is reported at Anniston, Ala., that Matthew, Addy & Co. of Cincinnati, Ohio, have leased the plant of the Anniston Pipe Works Company, and will place the same under operation.

The following are among recently-authorized corporations in Illinois: Western Sustalit and Stove Company, at East St. Louis; capital stock, \$150,000; for the manufacture of patent fuel, stoves and other furniture, and for heating buildings; incorporators, C. E. Bleyer, S. H. Burrell and G. H. Tenbroek. Chicago Automatic Fire Escape and Mfg. Company, to manufacture automatic fire escapes, stand pipes, ladders and do a general manufacturing business; capital stock, \$500,000; incorporators, S. R. Briggs, George W. Stevens and J. Danforth. Rockford Linen Fiber Company, at Rockford, to manufacture pulp, paper, cordage, &c.; capital stock, \$100,000; incorporators, Girden O. Williams, Albert D. Early and W. F. H. Tower. Wilson Road Cart Company, at Aurora; to manufacture road carts and other vehicles; capital stock, \$100,000; incorporators, O. Wilson, M. V. Allen and H. G. Logan. Hansell-Elcock Foundry Company, to manufacture architectural iron work and do a general foundry business; capital stock, \$75,000; incorporators, Joseph R. Hansell, Edward G. Elcock and Peter Marshall. The Aluminum Steel Tool Company, to sell certain patents pertaining to the manufacture of aluminum steel and to manufacture and sell products covered by such patents, &c.; capital stock, \$100,000; incorporators, N. H. Freeman, F. C. Ratan and T. J. Thompson.

A syndicate composed of General J. I. Wilder of New York, H. S. Chamberlain of Chattanooga, Tenn., and others have purchased \$125,000 worth of town-site property on the Chattahoochee River near Atlanta, Ga., where they propose establishing a manufacturing town. The same parties own a large tract of iron ore land in Cherokee County. The plans of the company contemplate the shipping of this ore to the new town, where furnaces, rolling mills and factories are to be established.

It is stated that the Bloomsburg Car Company of Bloomsburg, Pa., have been prospecting at Bristol, Tenn., looking to the establishment of a car-works plant in that place.

The capital stock of the Texas Car and Lumber Company at Tyler, Texas, has been increased to \$300,000.

The Martinsburg-Miami Mfg. and Improvement Company of Martinsburg, W. Va., have recently concluded negotiations for the establishment of an agricultural implement factory.

The Inter-Mont Mining, Manufacturing and Development Company have been organized in Virginia with a capital of \$2,000,000 to develop 8000 acres of mineral land in that State. W. B. McIlwaine of Petersburg, Va., is president of the company; W. A. French, vice-president, and E. H. Patterson, secretary.

The Columbia Steel Car Company have bought 20 acres adjoining their plant south of Des Plaines, Ill., for \$30,000.

The Automatic Station and Street Indicator Company, Rockingham, N. C., are considering the question of a new location. When this is determined they will build a new factory at once.

The Dunbar Furnace Company, Dunbar, Pa., have settled with the widows of the victims of the Hill Farm disaster by allowing them \$500 each and \$60 additional for each child.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., February 24, 1897.

Pig Iron.—The market remains in the same monotonous condition as reported for many weeks past. On the whole, the tendency appears to be toward improvement, but the movement so far is very slight, while once in a while weak spots are still to be met with. Offerings are not nearly as urgent as they were, however, so that there is a good foundation for improvement if the demand keeps up. Advices from other markets are favorable, but no one has had confidence enough so far to quote higher figures. But concessions are less frequent and less important, so that for all practical purposes prices show an average advance of at least 25¢ from the lowest, in some cases a little more than that. Some of the best Mill Irons are quoted at a further advance, say \$15.25 @ \$15.50, delivered, but so far as known no new business has been secured on those terms. There is a perceptible scarcity, however (compared with the three preceding months), and holders are almost unanimous in declining any business that involves a shading of prices. Exceptions, of course, must be made in the case of new brands, or where strictly prompt deliveries and settlements are required, but ordinarily buyers must pay market prices or take whatever risks there may be involved by delay in placing orders. This probably is all that can be fairly said of the market. Prices may advance 50¢ more, but there are no immediate indications of such an event. For the present it is a waiting market, and time only can tell what the outcome will be. At the moment there is a fairly active demand for everything; bids from large buyers, however, are usually at something less than quoted rates, which, as already stated, holders are not inclined to accept, so that actual transactions have been mostly in small lots to tide over until the future becomes less obscured. Lots delivered in consumers' yards command about the following rates:

Ohio Softeners, No. 1x.....	\$19.00	@ \$19.50
Ohio Softeners, No. 2x.....	18.00	@ 18.50
Standard Penna., No. 1x.....	17.50	@ 18.00
Standard Penna., No. 2x.....	16.50	@ 17.00
Medium Penna., No. 1x.....	17.25	@ 17.50
Medium Penna., No. 2x.....	16.00	@ 16.25
Virginia, No. 1x.....	16.75	@ 17.50
Virginia, No. 2x.....	15.50	@ 16.00
Standard Neutral All-Ore Forge.....	14.50	@ 15.00
Ordinary Forge Cinder mixed.....	13.75	@ 14.00
Charcoal Car-Wheel Iron.....	21.00	@ 25.00

Ferromanganese.—There is some inquiry for small lots at about \$61.50 @ \$62 for 80 %, duty paid, but importers claim that higher figures will be necessary to induce shipments from abroad.

Spiegeleisen.—Nominal at about \$29, duty paid, for 20 %, but there is no demand, large consumers having covered their requirements at less money.

Steel Billets.—There is so little doing that it is difficult to determine what the market really is. Pittsburgh quotations are distinctly higher, but without buyers prices are more or less nominal. The usual asking figures are \$28.75 @ \$29, delivered to mills near by, but it is intimated that a large Eastern mill has asked for bids of \$28 on Nail Slabs, with an intimation that this figure or a trifle less would be accepted for a good-sized order.

Steel Rails.—A somewhat larger business is reported, with prospects of a decided increase of activity in the near future. There are several quite important orders in prospect, but mills refuse to make concessions, \$29.50, at mill, having been declined for one lot of 10,000 tons.

Sales of a few hundred tons to 1000-ton lots are of quite frequent occurrence, so that mills are fairly well employed, considering the season and the general apathy in railway enterprises.

Muck Bars.—There appears to be no demand at over about \$26.50, delivered, but sellers still stand out for \$27 @ \$27.50. There is very little interest manifested in the market, however, and from present appearances this condition of affairs may continue indefinitely.

Bar Iron.—There is a fair business under way, but as mills are all keenly on the lookout for orders, prices remain in the same weak and unsatisfactory condition as reported for many weeks past. Quotations range all the way from 1.75¢ to 1.90¢, according to size of order and requirements as to quality. Car builders have in some cases placed orders at less than 1.75¢, delivered, while in other instances makers of first-class Iron remain firm at 1.85¢ @ 1.90¢, with scattering business at all sorts of intermediate prices. Prospects are a trifle better as regards the demand, but there is nothing to indicate any material change in quotations.

Skelp Iron.—The demand is very languid, and with the present outlook in the Pipe trade there is not much chance for improvement in the demand for Skelp Iron. Prices are nominally 1.75¢ @ \$1.80¢, delivered, for Grooved Skelp, and 1.90¢ @ 1.95¢ for Sheared.

Plates.—There is rather more inquiry for Bridge Plates, but other leading interests appear to be only poorly employed. This is specially the case with shipbuilders, who for the last year or two have been pretty steady buyers. In other directions there is a fair hand-to-mouth trade, but nothing to impart tone to the market, which is simply drifting along from week to week, neither gaining nor losing either in price or in activity. Pittsburgh appears to be less of a competitor, however, and if that continues for any length of time prices may soon stiffen a little. Meanwhile quotations for lots delivered in consumers' yards are usually given as follows:

	Iron.	Steel.
Ship Plates.....	2.00 @ 2.10¢	2.10 @ 2.20¢
Tank.....	2.00 @ 2.10¢	2.10 @ 2.20¢
Bridge Plate.....	2.05 @ 2.15¢	2.15 @ 2.25¢
Shell.....	2.30 @ 2.40¢	2.40 @ 2.50¢
Flange.....	3.10 @ 3.20¢	2.60 @ 2.70¢
Fire-Box.....	3.75¢	3.75 @ 4.25¢

Structural Material.—A trifle more inquiry is noted, and it is thought that both Bridge and Structural orders will soon begin to come on the market. There is a considerable amount of work under negotiation, and it is expected that mills will have fairly active employment during the spring and summer months. Prices are weak, but usually quoted about as follows for lots delivered in consumers' yards: Angles, 2.05¢ @ 2.10¢; Sheared Plates, 2.10¢ @ 2.15¢, and 10¢ @ 15¢ more for Steel, according to requirements. Tees, 2.5¢ @ 2.6¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Scrap Iron.—There is a fairly good inquiry at quoted rates, supply not large, but about equal to the demand, with sales at prices as follows: No. 1 Railroad Scrap, \$22.50 @ \$23, Philadelphia, or for deliveries at mills in the interior, \$22.50 @ \$23.50, according to distance and quality; \$15 @ \$16 for No. 2 Light; \$15 @ \$16 for best Machinery Scrap; \$14 @ \$14.50 for ordinary; \$15 @ \$16 for Wrought Turnings; \$10 @ \$10.50 for Cast Borings, and nominally \$25 @ \$26 for Old Fish Plates and \$17 @ \$18 for Old Car Wheels.

Sheet Iron.—Business is picking up a little, and the chances are that it will be quite active in the near future. Large buyers are already in the market, but their bids are usually too low for those who make first-class Sheets. It shows that

there is a demand, however, and for the present the only obstacle to business is the question of price. Ordinarily quotations for best makes are about as follows, but on large orders concessions are not infrequent:

Best Refined, Nos. 14 to 20.....3.00¢ @ 3.10¢
 Best Refined, Nos. 21 to 24.....3.15¢ @ 3.25¢
 Best Refined, Nos. 25 to 26.....3.30¢ @ 3.40¢
 Best Refined, No. 27.....3.50¢ @
 Best Refined, No. 28.....3.60¢ @ 3.70¢
 Common, $\frac{1}{4}$ ¢ less than the above.
 Best Soft Steel, Nos. 14 to 20.....3 $\frac{1}{4}$ ¢ @ 3 $\frac{1}{2}$ ¢
 Best Soft Steel, Nos. 21 to 24.....3 $\frac{1}{2}$ ¢ @ 3 $\frac{3}{4}$ ¢
 Best Soft Steel, Nos. 25 to 26.....3 $\frac{3}{4}$ ¢ @ 3 $\frac{1}{2}$ ¢
 Best Soft Steel, Nos. 27 to 28.....@ 4 $\frac{1}{2}$ ¢
 Best Bloom Sheets, $\frac{1}{4}$ ¢ extra over the above prices.

Best Bloom, Galvanized, discount..... @ 65 %
 Common, discount..... @ 67 $\frac{1}{2}$ %

Old Rails.—No business doing, holders being unwilling to name prices, while consumers appear to be out of the market, although at \$23 @ \$23.50, delivered, a few small lots might be taken.

Wrought-Iron Pipe.—At the meeting of the Pipe Association held in Pittsburgh last week nothing is reported as having been done but to reaffirm prices. This, however, seems to be of little effect, as cuts of 5 and 10 %, and even more than that, have been made within the past day or two. Nominal discounts are as follows:

Butt-Welded Black.....47 $\frac{1}{2}$ %
 Butt-Welded Galvanized.....40 %
 Lap-Welded Black.....60 %
 Lap-Welded Galvanized.....47 $\frac{1}{2}$ %
 Boiler Tubes.....50 %

(By Telegraph.)

The feeling is stronger in Pig Iron, sales in large lots having been made to-day at 50¢ over the rates at which the same Iron was offered two or three weeks ago. Bridge and Structural Material is also in better demand and the general tone of the market vigorous and improving. Steel Billets are also inquired for, with prospects of business at full quoted rates.

Cleveland.

CLEVELAND, February 23, 1891.

Iron Ore.—The proposition of certain furnacemen to withhold all inquiries for new Ore until mid-summer and then to buy only as their immediate wants suggest seems to be a popular one and is not unlikely to be adopted by a number of heavy buyers. There is absolutely no change in the local situation beyond some negotiations looking to the adoption of an 85¢ season rate from Escanaba. Ore is going forward to the furnaces at a snail's pace, less than 10,000 tons having been taken away during the past seven days. Reports from other lower lake ports show an equally indifferent endeavor to relieve the docks of the enormous quantity of Ore with which they were weighted down at the close of navigation last fall. There is absolutely no inquiry for new Ore, and if ever so many demands were being made mine owners would be at a loss on the question of prices, which, it is already admitted, must be considerably below those of 1890. There must still be nearly 2,000,000 tons of Ore at the lower lake ports, with a considerable quantity heaped up at every furnace. No estimates of the output of 1891 can be obtained from reliable sources but unless furnaces begin business before many days it seems likely to fall below 5,000,000 tons, if, indeed, it exceeds 4,000,000.

Pig Iron.—The interruption of a holiday has had its influence upon the market but the record of the past week emphasizes the prediction of one week ago, prices being decidedly firmer and the demand much more active. Ohio Silveries and Strong Foundry Irons are still favor-

ites, although there have been sales of Forge and Mill Irons in small amounts. The continuation of the coke strike for a few weeks would undoubtedly give additional strength to the market, the condition of which has forced buyers to the front. There is considerable inquiry for Bessemer Pig, but prices, although firmer, are somewhat uncertain. In the present unsettled condition of the market it is impossible to give anything like reliable quotations, which in a general way may be said to be from 50¢ to \$1 above those prevailing ten days ago.

Old Rails.—The market is fairly active, but prices are considerably below those quoted in January. Several fairly big sales of Old American at \$24.50 are reported, and \$24 would probably be accepted for a large order.

Scrap.—No. 1 Railroad Wrought at \$19.50 @ \$20 is selling quite freely. Wrought Turnings are worth \$14 @ \$14.50; Cast Scrap, \$14 @ \$14.50; Car Wheels, \$17 and Axles, \$24 @ \$24.50.

Manufactured Iron.—The demand for Common Bar at 1.70¢ @ 1.75¢ continues fairly strong. Muck Bar is in somewhat better demand at \$27.

Detroit.

WILLIAM F. JARVIS & Co., Detroit, Mich., under date February 23, 1891, write as follows: A decidedly large number of inquiries, both for smaller and larger lots, was seen in this market during the past week, and this refers to both Lake Superior Charcoal Iron and Southern Coke, the latter being confined chiefly to the low grades, however. The inquiry for Lake Superior comes principally from the malleable manufacturers, who report a large volume of business existing at the present time. It looks as if the early buying which they did last year was to be repeated during the present season. Prices have in no way changed, but cannot be lower than they are at present. The obstacles in the way of large manufacture of Coke Iron, which we mentioned in our report of a week ago, still continue, and have made a very strong Coke Iron market, which will continue to gain strength unless some of these causes be removed very soon, as at present there is a large inquiry remaining unsatisfied. Altogether the market looks decidedly better than a week ago, and quotations are about as follows to-day:

Lake Superior Charcoal, all numbers.....	\$19.00 @ \$19.50
Lake Superior Coke, Bessemer.....	18.00 @ 18.50
Katabdin (Maine Charcoal).....	23.00 @ 24.00
Lake Superior Coke Foundry, all ore.....	18.00 @ 18.50
Ohio Blackband (40 per cent.).....	18.00 @ 18.50
Southern No. 1.....	16.00 @ 16.25
Southern Gray Forge.....	14.25 @ 15.00
Jackson County (Ohio) Silvery.....	16.25 @ 18.75
Connellsville Coke.....	4.65

Pittsburgh.

Office of The Iron Age, Hamilton Building, }
 PITTSBURGH, February 24, 1891. }

Pig Iron.—The general position of the market continues much the same as noted in our report of last week. The Coke strike is still going on, and not much prospect of an early close. Production in this district at present is considerably less than consumption, and with a prospect of still higher prices consumers are anxious to buy, while producers are less anxious to sell. Furnacemen out in the Shenango and Mahoning valleys who have any Iron to sell say they can still do better at home than in this market, notwithstanding the recent improvement here. Our furnaces are pretty well sold ahead, and are not in position to make additional contracts for delivery during the next 60 or 90 days. One of them is reported as being sold four months ahead. Some Southern Iron has

been bought to come here and to Wheeling from the Sheffield, Ala., district, but all that can be obtained there will have little or no effect upon our market, and then the great distance makes the cost of transportation so much as to almost shut it out of this district. As compared with last week, prices have further advanced, and we now quote as follows:

Neutral Gray Forge.....	\$14.50 @ \$14.75, cash.
All-Ore Mill.....	15.50 @ 15.75, "
White and Mottled.....	13.50 @ 14.00, "
No. 1 Foundry.....	16.50 @ 16.75, "
No. 2 Foundry.....	15.25 @ 15.50, "
No. 3 Foundry.....	14.75 @ 15.00, "
No. 2 Charcoal Foundry.....	21.50 @ 22.00, "
No. 1 Charcoal Foundry.....	23.50 @ 24.00, "
Cold-Blast Charcoal.....	25.00 @ 27.00, "
Bessemer Iron.....	16.50 @ 16.75, "

Thus far there have been no sales of Bessemer reported above \$16.75, cash, but it is doubtful whether in the present condition of affairs additional purchases could be made at that figure, as it is becoming scarce and there is an increasing demand. As compared with the lowest point, Bessemer has advanced from \$1 to \$1.25 per ton, while Forge Irons have advanced 50¢ to 75¢.

Muck Bars.—There has been an increased demand developed the past week, and the market is stronger, in sympathy with Pig Iron. We now quote at \$27 @ \$27.50, cash, according to quality, with a sale of 500 tons reported by a city mill at \$27.75. It is worthy of mention that some consumers are willing to pay more for city-made Muck rather than take chances on that coming here from a distance, in regard to the quality of which they know little or nothing. There is an increasing anxiety on the part of some consumers to contract for future delivery, while sellers are timid, owing to the uncertainty in regard to getting a supply of Pig Iron.

Manganese.—There does not appear to be much doing, with the exception of small lots, which may be quoted at \$63 to \$65 for 80 % domestic. Demand is chiefly for small lots to supply immediate wants.

Manufactured Iron.—There is continued activity, and the fact that Pig Iron has advanced has made buyers of finished stuff more anxious to buy, as they realize very fully that finished products must sympathize with raw material, the two go together. City manufacturers quote Bars at 1.75¢ @ 1.80¢; Plate and Tank at 2.15¢ @ 2.20¢; No. 24 Sheet, 2.80¢ @ 2.85¢. Brokers who sell for valley mills quote Bars at 1.65¢ @ 1.70¢, half extras; Plate and Tank at 2.05¢, and No. 24 Sheet at 2.70¢, f.o.b. on cars at mills, 60 days, 2 % off for cash. Skelp Iron is quoted firm at 1.75¢ for Grooved and 2¢ for Sheared, four months, 2 % off for cash.

Nails.—There is an improved demand for Cut Nails, mostly from the South, and the market is firmer. We now quote at \$1.60 @ \$1.65, 60 days, 2 % off for cash, for large lots, and of desirable specifications. One of our best-informed brokers, and who makes a specialty of Nails, reports that none of the factories he represents are willing to sell below \$1.65 rates. While possibly the demand for Wire Nails is not as urgent as it was a few weeks ago, manufacturers are well sold up and the market is firm at prices quoted a week ago, \$2.10 @ \$2.15, 60 days, 2 % off for cash, according to character of order and delivery.

Wrought Iron Pipe.—A good degree of activity is reported, and there is every indication that trade will improve as the season becomes more advanced. Orders always commence to come forward more freely with the advent of the spring season, now close at hand. The regular monthly meeting of the Manufacturers' Association took place in this city last week, but there was no change whatever made in prices. Discounts on Black Butt Weld Pipe, 47 $\frac{1}{2}$ %; on Galvanized do., 40 %; on

Black Lap, 60 %; on Galvanized do., 47½ %; Boiler Tubes, 1½ inches and smaller, 45 %; 2 inches and larger, 45 %; Casing, all sizes, 50 %.

Old Rails.—There have been sales of Old Iron Rails made here during the past week at \$25.50, and they are now held at \$26. Old Steel Rails have been in active demand for some weeks past, and we now quote short and mixed lengths at \$18 @ \$18.50, showing an advance of from \$2 to \$2.50 per ton within the past few weeks.

Billets and Slabs.—There is considerable inquiry for Bessemer-Steel Billets, which may be quoted as a week ago at \$26 @ \$26.50, cash, at maker's mill, according to character of contract and delivery. Desirable contracts can still be made at \$26, f.o.b. at maker's mill. The market is firm, with most of the mills pretty well sold ahead. Nail Slabs about the same in price as Billets.

Wire Rods.—There has been no new business reported during the past week; not that there was not inquiry, but because mills running, being sold ahead, are not in position to take orders for immediate or nearby delivery. It is doubtful whether an order could be placed in this district for delivery before May. We quote, in absence of sales, at \$39, f.o.b. at makers' mill. The Braddock Rod Mill has been standing idle for several weeks in consequence of labor complications.

Steel Plates.—There is a continued good degree of activity, but prices remain unchanged. Fire Box, 4.25¢ @ 4.50¢; Flange, 2.80¢ @ 2.90¢; Shell, 2.60¢ @ 2.70¢; Tank, 2.25¢ @ 2.35¢. The contract noted in our report of two weeks ago as having been closed by Carnegie, Phipps & Co. with the United States Navy Department was for 6000 tons of Armor Plate, instead of 1060 tons, as erroneously stated.

Structural Iron.—There is a fair business, but the only change in prices is a reduction in Angles of \$1 per ton. Channels and Beams, 3.10¢; Angles, 2.10¢ @ 2.20¢; Sheared Bridge Plates, Steel, 2.40¢ @ 2.45¢; Universal Mill Plates, Iron, 2.20¢; Refined Bars, 1.90¢ @ 1.95¢.

Merchant Steel.—Manufacturers continue to quote as follows, although possibly they might cut rates quoted on a desirable order: Tool Steel, 8¢ and upward; Crucible Spring Steel, 4¢; do. Machinery, 5¢; Open-Hearth Steel, base sizes, 2½¢ @ 3¢; Bessemer Machinery Steel, 2.40¢ per lb rates; Tire Steel, 2.55¢.

Steel Rails.—There has been no new business reported here of late. The mill at Braddock is still undergoing repairs, and there is talk of it being started up soon.

Railway-Track Supplies.—Railroad Spikes have been reduced to \$2.05 for either Iron or Steel, f.o.b. at makers' mill; Splice Bars, either Iron or Steel, 1.90¢ @ 2¢; Track Bolts, 2.80¢ with Square and 2.90¢ with Hexagon Nuts.

Old Material.—There is a continued fair demand for No. 1 Railroad Wrought, and is firm at \$20, net ton; Car Axles, \$27.50 @ \$28; Old Car Wheels, \$17, gross; Cast Scrap, \$14.50; Steel Rail and Bloom Ends, \$17.50 @ \$18.

Coke.—The strike continues and there is but little business being done; in regard to the strike it may collapse in a few days and it may continue two or three months.

(By Telegraph.)

Pig Iron continues firm, with an increasing demand. Sale reported of 2000 tons Gray Forge at Wheeling, \$15, cash. Rumored that sales of Bessemer Iron have been made here at \$17, cash. Sale of 1500 tons Old Steel Rails, short pieces, at \$18.25 cash.

Chicago.

(By Telegraph.)

Office of The Iron Age, 59 Dearborn street, CHICAGO, February 25, 1891.

General business is moving along in tolerably fair shape, but everything depending upon railroad patronage is very dull except Rails alone. The flood at Pittsburgh has caused much inconvenience here among those who are relying upon shipments from the submerged mills. Consumers are carrying such light stocks that interruptions of but a few days in deliveries cause them much annoyance.

Pig Iron.—A good demand is noted for Coke Iron. The Connellsville Coke strike is already having an appreciable effect here in causing consumers to cover their requirements and also in stiffening prices. Buyers are now hunting sellers and asking for lots offered them two weeks since at special prices, but find that the prices have been withdrawn. There is naturally much reluctance to pay the higher rates asked, but there seems to be no escape from it. Those sellers who are still below the top notch are picking up a considerable volume of business. Southern furnacemen are benefited by this condition of affairs, but they are not now disposed to sell far ahead at present prices. Jackson County Iron has advanced 50¢, and is now held at \$18.70, Chicago, cash. Local Coke Irons are unchanged. The announcement that a large Cast Pipe foundry is to be built at Milwaukee by the Illinois Steel Company is received with much pleasure by the trade. New outlets of that kind are needed. The Illinois Steel Company are also making Spiegeleisen for the general trade, having at length passed the point of supplying their own requirements. Lake Superior Charcoal Iron continues quiet, but at the same time there is a firmer feeling manifested by the makers, a considerable part of whom will blow out their furnaces in the spring if trade does not improve by that time. A meeting of the manufacturers is to be held soon for the purpose of taking some kind of concerted action. We quote:

Lake Superior Charcoal	.....	\$18.00 @ \$18.50
Local Coke Foundry, No. 1	.....	15.50 @ 16.00
Local Coke Foundry, No. 2	.....	15.00 @ 15.50
Local Coke Foundry, No. 3	.....	14.50 @ 15.00
Local Scotch	.....	16.00 @ 16.50
Ohio Strong Softeners	.....	18.50 @ 19.10
Southern Coke, No. 1	.....	16.25 @ 16.75
Southern Coke, No. 2	.....	15.75 @ 16.00
Southern Coke, No. 3	.....	15.25 @ 15.50
Southern, No. 1, Soft	.....	15.75 @ 16.00
Southern, No. 2, Soft	.....	14.75 @ 15.00
Southern Gray Forge	.....	14.50 @ 14.75
Southern Mottled	.....	@ .....
Tennessee Charcoal, No. 1	.....	18.50 @
Alabama Car Wheel	.....	22.50 @ 23.50
Coke Bessemer	.....	17.00 @
Hocking Valley, No. 1	.....	17.50 @

Bar Iron.—Some manufacturers report a fair demand from consumers and jobbers, while others complain of dullness. A small lot of Car Iron was sold at a very close price, but is claimed to have been a special transaction. Other car orders are in the market for 1000 tons or more, and they will test its strength. Local mills are not so firm as Mahoning Valley mills, who are feeling the effect of the Coke strike. The latter quote 1.60¢, at mills, as bottom, for ordinary specifications, but the former still name 1.70¢, Chicago, and this will be shaded by one or two concerns. The condition of the Bar-Iron trade is very uncertain just now, but the chances seem to be in favor of an advance rather than a decline, with much depending upon the attitude of mills further East.

Structural Iron.—The building season seems to have opened throughout the Northwest, and a great deal of material is being called for. Several very heavy contracts are pending in this city, requir-

ing large quantities of Beams, which may be closed any day. Prices are unchanged.

Plates.—Mill prices seem to have touched bottom, as manufacturers are indisposed to duplicate orders taken a short time since. Almost every dealer in Plates reports trade quiet at present. This month promises to be the worst February for a number of years. Inquiries are coming up in some directions, but general business is unsatisfactory. The Tube market is in good shape, both the demand and prices being well sustained. Nos. 10 to 14 Iron Sheets, 2.75¢ @ 2.80¢; Steel Sheets, 2.90¢ @ 3¢; Tank Iron, 2.55¢ @ 2.65¢; Tank Steel, 2.65¢ @ 2.75¢; Shell Iron or Steel, 3.25¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.25¢ @ 5.5¢; Boiler Rivets, 4¢ @ 4.25¢.

Sheets.—The Black Sheet mills seem to have suddenly sold their product for some time to come, as one after another is reported out of the market. The Roofing trade is probably responsible for most of the improvement. Jobbers are now making inquiries for deliveries in May, June and July. Galvanized Iron is very active. No advance has yet been made, but the mills are rapidly filling up with work and are running behind in shipments. Prices are unchanged except that the jobbers seem to be well stocked with Iron bought at low prices, and are hardly as firm as they were a week or two since.

Merchant Steel.—Some improvement is reported, but not enough to change the general character of the trade. We quote Tool Steel 6.75¢ @ 7¢, according to quality. Usual quotations are 2.40¢ @ 2.50¢ for Tire Steel, 2.40¢ @ 2.75¢ for Open Hearth Machinery, 2.50¢ @ 3¢ for Open-Hearth Spring, 2.20¢ @ 2.30¢ for Bessemer Machinery and 2.50¢ @ 2.75¢ for Toe Calk.

Track Supplies.—The Rail manufacturers state that business is looking much better with them, but make no mention of any special feature. The South Chicago mill was started again last week, having been idle about seven weeks. Quotations still range from \$31 to \$32.50; Iron Splice Bars are quoted at 1.95¢ @ 2¢; Spikes sell at \$2.10 from stock and \$2 prompt delivery from mill; Track Bolts with Hexagon Nuts are quoted at 3¢ from stock and 2.90¢ from mill, for best makes, down to 2.80¢ for Common Iron.

Old Rails and Wheels.—Several thousand tons of Old Iron Rails were sold at about \$23. Holders generally ask \$23.50. Steel Rails are in somewhat better demand, and are now quoted at \$15 @ \$18.50, according to length; Car Wheels are dull and nominal at \$17 @ \$17.25.

Scrap.—Cheap grades are at last in a little better demand. Mixed Steel is also improving. Dealers report prices well maintained, but consumers are picking up outside lots at lower prices. Selling prices per net ton are about as follows: No. 1 Railroad, \$19.50; No. 1 Forge, \$18.50 @ \$19; No. 1 Mill, \$13.50 @ \$14; Fish Plates, \$22; Axles, \$25; Pipes and Flues, \$12.50 @ \$13; Horseshoes, \$18.50; Cast Borings, \$8.50; Wrought Turnings, \$11.50; Axle Turnings, \$13; Machinery Cast, \$12.50; Stove Plates, \$8.50 @ \$9; Mixed Steel, \$15; Leaf, \$16; Tires, \$18.

Metals.—Spelter is rather dull, with quotations ranging from 4½¢ to 5¢, according to brand. Copper holds its own at about 15.25¢ for Lake and 12¢ for casting brands, carload lots.

Pig Lead.—Prices are still tending downward. Business has been very dull here, the trading being mainly confined to carload lots at 4½¢, the closing is weak at 4.10¢ for both Desilverized and Missouri Leads.

New York.

Office of *The Iron Age*, 96-102 Reade street,
New York, February 25, 1891.

American Pig.—Deliveries of Foundry Iron are running somewhat freer, and, in the instance of particularly favored Northern brands, the movement has been sufficient to make some inroads upon the January accumulation at furnaces, besides absorbing the current output. The popular brands are thus holding their own remarkably well, while on others that do not stand as high in the estimation of consumers prices are still somewhat irregular. Several lots of warrant Iron, for example, have been disposed of at \$11.25 at furnace, or the equivalent of \$15.50 at tidewater, for No. 2, which price is 50¢ @ \$1 below those quoted for Standard brands by furnace agents. Orders for high-grade Foundry Pig are coming along very fairly and serve to give more tone to the market for that class of material; but low-grade Foundry and Mill Iron seems to be plentiful at old figures. The extreme range on Northern brands is \$17 @ \$18 for No. 1, \$16 @ \$16.50 for No. 2 and \$14 @ \$15 for Gray Forge. Southern sells at \$16.25 @ \$17.50 for No. 1 Foundry, \$15.25 @ \$16 for No. 2 and \$14 @ \$15 for No. 3, according to brand.

Spiegeleisen and Ferromanganese.—Some few orders for 20 % Spiegel have been placed at about \$28 for German and \$28.50 for English, and at \$23.50 for 10 @ 12 %, but the demand is slow at present, and it would doubtless be difficult to move additional quantities at as good prices. For 80 % Ferromanganese there is little demand, and prices are barely steady at \$61 @ \$62 for deliveries here.

Steel Rails.—As far as reported, the transactions have been confined wholly to unimportant lots and chiefly light sections. Large orders are held in abeyance, and the railroad companies apparently have no great faith in the endurance of the Rail manufacturers' agreement. It is the fact that small orders have been taken at \$30, less brokerage, and buyers assert that the rate quoted has been, and still would be, shaded on really desirable orders. It would thus appear that the firmness of the market is largely superficial.

Billets and Rods.—There is no change in the situation here. Orders come in slowly and are invariably for unimportant quantities. Ordinary soft Billets are still quoted at \$27.50 @ \$28, f.o.b. Eastern Pennsylvania mill, and Wire Rods at \$38 @ \$38.50 at tidewater.

Manufactured Iron and Steel.—In this line new business has been unimportant and prices are still irregular. We quote Angles, 2¢ @ 2.10¢; Sheared Plates, 2.05¢ @ 2.25¢; Tees, 2.5¢ @ 2.75¢, and Beams and Channels, 3.1¢, on dock. Steel Plates are 2.05¢ @ 2.15¢ for Tank, 2.35¢ @ 2.6¢ for Shell, and 2.6¢ @ 2.7¢ for Flange, on dock. Bars are 1.7¢ @ 1.9¢, on dock.

Rail Fastenings.—The purchase is reported of 10,000 kegs of Spikes for the New York Central Railroad Company at a very low price. Outside of this nothing more than routine transactions come to notice. Values are still rather in buyers' favor, \$1.90 @ \$1.95 quoted for Spikes, 1.75¢ @ 1.80¢ for Angles and 2.65¢ @ 2.75¢ for Bolts.

Old Material.—Sales of Old Iron Rails have been few in number and confined to small lots. On Tees better offers than \$21 are rare and holders consider \$22 @ \$22.50 as being very close rates. Wrought Scrap has been sold at \$19 @ \$19.50, ex ship, to the extent of several hundred tons. Parcels afloat may be had at the same price.

Financial.

The Sherman obsequies and holiday interruptions made a short week. The check thus interposed, together with general dullness, results in a reduced volume of trade. The deterrent influence of Congress is recognized, but the adverse report of the Silver Coinage Committee and the nomination of a supposed capable successor to the late Secretary are events regarded as eliminating, at least for the present, dangerous currency agitation. The nominee for the Treasury, Charles Foster of Ohio, is quoted as saying that he believes "in maintaining the ratio of gold and silver so that a parity in the value of the two metals may be brought about. This can be best accomplished," it seems to him, "by the methods at present adopted, until the world is ready to undertake some movement by which all civilized countries will recognize both metals." Among the unfinished business in the Senate are the Bankruptcy and Subsidy bills, for which their friends have hope. The legal proceedings to wind up the American Loan and Trust Company are temporarily suspended, while efforts are making to effect a reorganization and save the charter. The trouble was precipitated by the unexpected call of three savings banks for the amount of their deposits. Advantage may result from a more rigorous inquiry by the Bank Superintendent into the condition of other kindred institutions classified as "weaklings." The strike in the coke regions and the demands of the employees of the Pennsylvania Railroad Company west of Pittsburgh have caused some anxiety. Experts estimate that the coke strike cost the men up to the beginning of the week \$227,500, on a basis of \$1.75 per day for each of the 13,000 men involved. Foreign commerce since January 1 falls below that of the corresponding period in the last two years, and net railroad earnings are less favorable as compared with the big earnings of a year ago. On the other hand, the Western Traffic Association is reported to have made substantial progress, concern being felt only in regard to possible unfriendly legislation by Western legislatures. The new association, Mr. Walker said, is better than any other association heretofore organized in the same territory.

The breaking up of ice in the Straits of Mackinaw and the resumption of navigation on the Hudson as far as Albany are supposed to indicate an early movement in commerce via the Lakes. The Kansas State Board of Agriculture says prospects encourage expectations of a very large winter wheat crop.

The Stock market was stagnant. One feature was a fall in silver bullion certificates to 96½, the lowest price recorded since the advance caused by the passage of the act of July, 1890. Rock Island was favorably influenced by a semi-official statement that nearly the whole of its annual dividend had been earned. Some disappointment was felt because the Northern Pacific directors did not declare an extra dividend, the reason assigned being that it was better to use the money for betterments than to sell bonds for that purpose. The Chicago and Alton statement will show a surplus of \$180,000 over all charges and dividends.

United States bonds are quoted as follows:

U. S. 4½s, 1891, registered...	101½
U. S. 4½s, 1891, coupon...	103
U. S. 4s, 1907, registered...	120½
U. S. 4s, 1907, coupon...	120½
U. S. currency, 6s, 1895...	109

Movements of merchandise are on a moderate scale, the country's trade showing much conservatism. Wheat is slow, despite the wide outlet for flour, but for corn there was a sharp bull movement,

and dairy products are advancing. Refined sugar is in more demand, and coffee steady. Provisions dull. India rubber quiet. Ocean freight is taken at low rates. Collections are good with dry-goods jobbers, and the situation generally is regarded as sound.

The bank statement showed a loss of \$3,708,400 in cash and of \$3,119,675 in surplus reserve, leaving this item \$15,373,025. In loans there was a further expansion of \$1,558,000.

Sterling exchange is dull at \$4.86 @ \$4.89. Money had a hardening tendency, induced by the fact that the Government received from the customs more than it disbursed, and the market was affected by gold exports. Time contracts were not freely offered, as several of the banks found employment for all their funds, but rates remained at 4 % for 30 to 90 days and 5 % for 60 to 90 day indorsed bills receivable.

The silver pool in New York is reported to have lost heavily from the collapse of the Anti-Free Coinage bill in Congress. At the outset of the scheme silver jumped up rapidly until it was quoted at \$1.21½ per ounce, and the metal was expected to rise to \$1.29, equal to a dollar in gold. At length silver was stored in New York to the extent of about 10,000,000 ounces, including 7,333,000 in the vaults of the Mercantile Safe Deposit Company. It is said the average cost to the speculators has been about \$1.10 an ounce. To prevent importations they have been compelled to keep the Government supplied, and their sales have realized only about \$1.05 an ounce. They are, therefore, out 5¢ an ounce on their transactions, or say \$2,500,000, including storage charges and interest.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts.,
CHATTANOOGA, February 23, 1891.

Pig Iron.—During the past few days the market has settled down to a pretty firm advance of 25¢ @ 50¢, and appears to be quite steady at that, although there is still a great deal of Iron selling at figures below this. Opinion seems very much divided as to future prices. Some furnaces are asking figures much higher than this, while others are still contracting at previous prices for old stocks. Upon the whole, however, the condition of the market may be said to be somewhat improved. It is the general opinion that future prices will somewhat depend upon the future mining interests through Pennsylvania, consequently the position taken by furnaces through Ohio and other Northern districts. In regard to the standard brands the prices are firm, and there is not a great deal of this Iron on the market, and where sales are made for future delivery they are made at outside figures. Some brands that are known to be of an inferior quality are still being sold at old prices. Taking it all in all it would be impossible to make a correct statement of the market at the present time, but we think that \$13 for No. 1 would be a very fair figure.

Louisville.

LOUISVILLE, KY., February 23, 1891.

Pig Iron.—There has been one large transaction during the week, an additional purchase of 6000 tons. The balance of the buying has been of smaller lots, though purchases of 1000 and 1500 tons for delivery running through the year were made. The price at which most of the Iron was sold was on basis of \$10.25 for Gray Forge at Birmingham; one sale, however, of 6000 tons of Gray Forge is reported at \$10.50, cash, cars at furnace. Buyers appear willing to purchase for their future

wants at present prices, feeling that Iron is very low and that it is to their interest to buy. There has been no marked advance; \$10.50 for Gray Forge, Birmingham, probably representing outside views of furnaceman, with sales made for a quarter less on the part of some. The Connells-ville strike has not affected the Western market save to cause buyers to purchase more freely; part of this results from advices from Pittsburgh which indicate that the Coke strike was forced upon the miners, and that as soon as low Ore contracts can be placed the strike will be settled. This, however, is not the general view, as it is felt that the strike is a legitimate one based upon outside differences which it will take a prolonged struggle to settle between the coke workers and operators. Stocks in the South are being decreased. We quote:

Southern Coke, No. 1 Foundry...	\$14.00 @	\$14.50
Southern Coke, No. 2 Foundry...	13.50 @	14.00
Southern Coke, No. 3 Foundry...	13.00 @	13.50
Southern Coke, Gray Forge...	12.50 @	13.00
Southern Charcoal, No. 1 Foundry	16.00 @	17.00
Southern Car Wheel...	17.00 @	20.00

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st.,
St. Louis, February 23, 1891.

Pig Iron.—Trade during the week under review has been larger than for some time past. Prices show more firmness and there is less disposition among consumers to hold off for lower figures. The Coke strike has caused an increase in the demand for Coke, and the effect is felt somewhat in Pig Iron. It is reported that several of the Southern furnaces are behind in their orders. General business is in good shape, and the outlook for a large spring trade is considered quite encouraging. Agents are less disposed to peddle their Iron from buyer to buyer, seeking an offer, and are now holding off some what. Whether they will be disappointed or not remains to be seen, but the indications at the moment are favorable for the consummation of their anticipations in the direction indicated. Sales during the week have been at full prices, and it is only occasionally that Iron is offered at less than the figures quoted herewith:

Southern Coke, No. 1 Foundry...	\$15.75 @	\$16.00
Southern Coke, No. 2 Foundry...	14.75 @	15.00
Southern Coke, No. 3 Foundry...	14.25 @	14.50
Gray Forge...	13.75 @	14.00
Southern Charcoal, No. 1 Foundry...	17.50 @	17.75
Southern Charcoal, No. 2 Foundry...	17.00 @	17.25
Missouri Charcoal, No. 1 Foundry...	15.50 @	16.00
Missouri Charcoal, No. 2 Foundry...	15.00 @	15.25
Ohio Softeners...	18.00 @	19.00

Bar Iron.—The market shows no particular change, either as regards prices or volume of trade. Spring buyers are inquiring for prices, and the ordinary run of orders is sufficient to keep mills comfortably employed. We quote as follows: Lots from mill command 1.75¢ @ 1.80¢; small lots from store are quoted at 1.85¢ @ 1.90¢.

Barb Wire.—A fairly satisfactory trade is reported, and mills have no reason as yet to complain for want of orders. The agreement between the manufacturers appears to be indefinitely delayed, and if prices are to be advanced, it is more than probable that this long-promised agreement will not be the reason for so doing. Stocks in jobbers' hands are light, and the spring trade will shortly open; an increased business from this direction is confidently expected. Prices are firmly adhered to, as follows: Painted Climax, 2.80¢; Glidden, 2.85¢, and Acme 2.90¢; Galvanized 60¢ additional. Carload lots, 5¢ @ cwt. less than above prices.

Coal Market.

The Anthracite Coal trade is dull and weak, owing to the persistence of some of the leading operators in mining Coal in excess of their allotment. The relations of the companies in some instances are badly strained, and some of the individual operators, who owe no allegiance to any combination, either actual or tacit, are constrained to shut down rather than mine at a loss. The Lehigh Navigation Company shut down for a week, ostensibly for repairs. The Lehigh Valley and the Reading are also said to be retarding the movement of Coal, but the Reading officers are quoted as saying that they do not intend to look on passively while their competitors are getting an undue share of the business. The output for the week was 187,000 tons more than for the corresponding week last year, and since January 1 to date the aggregate is 4,379,000 tons, an increase of 984,000 tons. Reading reports for the week 125,000 tons. The Pennsylvania Railroad's tonnage was 267,500 tons of Coal and 57,500 tons of Coke. Prices are about as follows, f.o.b.: Broken, \$3.40; Egg, \$3.50; Stove, \$3.75 @ \$3.90; Chestnut, \$3.30 @ \$3.50; Pea, \$2.70; Buckwheat, \$1.65.

The Bituminous Coal market is active, and a few large contracts are said to have been closed at a slight advance over last year. The Coke strike causes much anxiety among Coke consumers.

The Delaware and Hudson Coal Company report having mined during the year 3,706,148 tons of Coal. Sales, \$7,875,378.

Respecting alleged causes of dissatisfaction in the Coal trade, the Philadelphia Press says: "New York companies seem to be in a shiver over the alleged aggressiveness of the Reading. It can safely be said that Mr. McLeod does not mean warfare on anybody, and he does not expect to increase the Reading tonnage to 12,000,000 this year, notwithstanding all reports to the contrary. Mr. McLeod feels strongly that the Reading Company have suffered severely in order to benefit their competitors in the Anthracite trade for some 12 years. During this period the increase in the Coal tonnage, which has been nearly 16,000,000, has gone altogether to the competitors of the Reading Company. Hereafter the Reading will insist at least on their proportion of the natural yearly increase in the production, or, say, 21.74 % of 1,400,000 tons in the year 1891."

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts.,
CINCINNATI, February 25, 1891.

The past week has been a busy one in local Pig-Iron circles, but while the volume of business has been less than during the preceding week, there has been quite an active inquiry for various brands, especially for long deliveries. The smaller sales, therefore, have been due rather to a lack of Iron than any diminution of the demand. A number of the Northern stacks are banked because of the coke strike and there is no immediate prospect of a resumption. Most of the Southern furnaces are sold well ahead, some of them into May. The range of prices has varied little from those current a week ago, but for prompt shipment some little advance has been realized. Forge Iron is sold more readily than Foundry grades. A few transactions varying between 1000 and 4000 tons have been consummated, but the remainder of sales have been largely for single car lots up to 500-ton lots. They have been well distributed throughout the country, and are for various brands such as Softeners, Charcoal and Silvery Irons, as well as standard brands of Foundry and

Mill grades. Among the larger sales which have been made during the past few days are the following: 3800 tons Southern Silvery Iron on the basis of \$11.25, cash, for delivery during five months; 1000 tons Southern Gray Forge on the basis of \$10.25, cash, for long delivery; 1000 tons do., \$10.60, cash, immediate shipment; 2000 tons Mottled Iron \$9.75, cash, for three months' delivery; 600 tons White Iron at \$9.70 for prompt shipment, cash basis, all at furnace; 500 tons No. 3 Foundry has also been sold at \$11.25, cash, Birmingham; 1000 tons Car Wheel, Southern make, at \$21.75, cash, Cincinnati, five months' delivery at 200 tons per month. The sale quoted last week for \$23.50 proves to have been an error; \$22.50, four months, should have been the quotation for the 2300 tons sold.

Foundry.	
Southern Coke, No. 1.....	\$14.00 @ \$15.00
Southern Coke, No. 2.....	13.75 @ 14 00
Southern Coke, No. 3.....	13.25 @ 13 50
Ohio Soft Stone Coal, No. 1.....	17.00 @ 17.25
Ohio Soft Stone Coal, No. 2.....	16.00 @ 16.50
Mahoning and Shenando Valley.....	17.50 @ 18.00
Hanging Rock Charcoal, No. 1.....	21.00 @ 22.00
Hanging Rock Charcoal, No. 2.....	19.50 @ 20.50
Tennessee and Alabama Charcoal, No. 1.....	18.00 @ 19.00
Tennessee and Alabama Charcoal, No. 2.....	18.50 @ 19.50
Forge.	
Gray Forge.....	12.75 @ 13.00
Mottled Neutral Coke.....	12.25 @ 12.50
Car Wheel and Malleable Irons.	
Southern Car Wheel.....	22.50 @ 23.50
Hanging Rock, Cold Blast.....	24.00 @ 24.50
Lake Superior Car Wheel and Malleable.....	21.00 @ 22.00

Imports.

Hardware, Machinery, &c.

Barbour Bros. & Co., Mach'y, csc., 1
Boettger & Hinze, Mach'y, pgs., 9
Boker, Hermann & Co., Mdse., cs., 40; Hdw., cs., 14; Ironware, cs., 16; Gun Barrels, cs., 4
Belknap, W. B. & Co., Anvils, 84
Chrome Steel Works, Mdse., cs., 2
Edison General E. Co., Mach'y, pgs., 14
Electric Cutlery Co., Mdse., cs., 3
Engelhorn, L., Mach'y, csc., 1
Field, Alfred & Co., Anvils, 146; Shovels, pgs., 3
Greenwood, E. A., Mach'y, cs., 2
Johnson, John & Co., Mach'y, pgs., 72
Lings Spinning Co., Mach'y, cs., 5
McCoy & Sanders, Ironware, cs., 6
Newman H. & Co., Ironware, cs., 6
Sacks & Richmond, Nails, cks., 35
Steglich & Baese, Mach'y, cs., 5
Sheldon, Geo. W. & Co., Mach'y, cs., 20
Sellers, W. B., Mdse., cs., 4
Werleman, H., Arms, cs., 12
Wiebusch & Hilger, Mdse., cs., 18; Hdw., cs., 10
Order—Mach'y, cs., 9; Connecting Rods, 20; Wheels, 90, &c.

Freights reported scarce and higher. On Tuesday Coal stocks were unfavorably influenced by the stagnation in the trade and reports of shading of prices of Coal. Prices generally were steady for all except sugar refiners', which was heavy. News from Boston was that a crisis has arisen in the affairs of the Commonwealth Loan and Trust Company, and the Windsor, Vt., National Bank was reported failed on account of losses in Kansas banks. Timely rains fell in Minnesota and Dakota.

Exports for the week at this port \$4,943,000, and for the year since January 1, \$49,800,000 against \$53,000,000 last year. Imports since January 1, \$77,387,000, against \$78,000,000 for same time last year. The bank clearings of 56 cities last week were \$980,122,577; increase of 2.4 per cent. Outside of New York the increase was 18.9 per cent.

The Eastern iron trade has been disquieted during the past few days by rumors relating to the financial difficulties of a large works in Eastern Pennsylvania.

The Kilmer Mfg. Company of Newburg, N. Y., have completed the construction of their rod mill and have had it in successful operation during the past few days.

Metal Market.

Copper.—The situation is wholly unchanged. Consumers adhere to the policy that has been followed since the beginning of the year, and buy only as imperative wants necessitate. The requirements, to all accounts, are not particularly urgent. The idea is entertained that the leading Lake Superior producers will ere long mark their price for Ingot down to 14¢, in view of the fact that outside lots are selling at, or very close to, that rate, and that supplies continue to rapidly increase under current heavy output from the mines. As yet, however, the "nominal" price remains at 15¢. Arizona Ingot is still quoted at 12½¢ @ 13¢, and finds limited sale. Casting brands have not moved as freely as they did during the preceding week, but prices remain steady at 11½¢ @ 11¾¢. The export demand for Matte has slackened, and sales at better than 10/ per unit, f.o.b. Liverpool, would appear difficult to put through.

Pig Tin.—Speculation has been almost at a standstill in this market. Operators appear to have protected their "puts," &c., and, in the absence of any cue from London, there is no inclination to venture with new engagements. The jobbing trade have been very cautious buyers also, and purchases by consumers are still on strictly conservative lines. Ten-ton lots for prompt delivery were valued at 19.90¢ net cash, and March delivery about the same. Jobbing parcels move at 20¢ @ 20¼¢, according to quantity and terms.

Pig Lead.—The market is wholly unchanged. Consumers have purchased moderate quantities at 4.30¢, but do not bid above 4½¢ for round lots, and manifest indifferent interest. The trade demand is slow and hesitant. Speculative interest is not manifested.

Spelter.—No increase is noted in the purchases by galvanizers or brass manufacturers, nor does the demand show any improvement. Smelters offer freely for shipment the coming month, and 5¢ would doubtless be accepted for prime Western carload lots, although 5.05¢ is generally quoted.

Antimony.—Apart from the ordinary distribution there has been very little movement and prices still lean in buyers' favor. Hallett's may be had at 16¢ @ 16¼¢ and Cookson's at 17¼¢ @ 17½¢, in wholesale quantities.

Tin Plate.—The market has been quiet throughout the week. Apart from resales of lots afloat and for shipment at slightly modified prices, little business has taken place, and the demand for both spots and futures is light at the present time. Quotations for large lots on the spot are as follows: Coke Tins—Penlan grade, IC, 14 x 20, \$5.45; J. B. grade, do., \$5.50 @ \$5.55. Bessemer do., \$5.45; Siemens Steel, \$5.55. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.65; Siemens Steel, IC basis, \$5.75; IX basis, \$6.75. IC Charcoals—Melyn grade, \$6.25; for each additional X add \$1.50; Allaway grade, \$6; Grange grade, \$6.10; for each additional X add \$1. Charcoal Terns—Worcester, 14 x 20, \$5.62½; 20 x 28, \$11; M. F., 14 x 20, \$7.75; do., 20 x 28, \$15.50; Dean, 14 x 20, \$5.25; do., 20 x 28, \$10.35; D. R. D. grade, 14 x 20, \$4.95; do., 20 x 28, \$10; Mansel, 14 x 20, \$5; do., 20 x 28, \$10.10; Alyn, 14 x 20, \$5.15; do., 20 x 28, \$10.25; Dyffryn, 14 x 20, scarce; do., 20 x 28, \$10.50. Wasters—S. T. P. grade, 14 x 20, \$4.80; do., 20 x 28, \$9.62½; Abercarne grade, 14 x 20, \$4.80; do., 20 x 28, \$9.50.

New York Metal Exchange.

The following sales are reported:

FRIDAY, February 20.
25 tons Tin, last half March.....19.90¢
TUESDAY, February 24.
16 tons Lead, February.....4.30¢

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, February 25, 1891.

Operations in Pig-Iron warrants have been moderate, and prices show comparatively little change. Outside speculative interest is very small, and while the "bear" interest have manifested more disposition to cover, the movement has had no effect upon prices. Some holders stand out firmly for higher prices, but others realize when opportunity offers, in view of the preparations making for starting up furnaces. There are at present no less than 14 furnaces blowing in in Scotland that will probably be in operation on March 3. The output will be confined to Bessemer and best Scotch brands. Shipments have been heavier the past week and withdrawals from warrant stocks quite large. Latest trading in warrants was at 46/10 @ 47/ for Scotch, 41/11 @ 42/ for Cleveland, and 50/9 @ 50/10 for Hematites.

Prices for Pig Tin declined early in the week to £89.10/, spot, under the influence of free selling by large importers. The low price induced some outside speculative buying, but the market has again flattened. Eastern shipments are expected to be heavy, but are partially offset by heavy consumption in Tin Plate manufacture and for other purposes.

Copper has undergone very little change, but the market is firmer. Sellers are reserved in their offerings, and speculative interest is rather more active. Higher prices are expected, as there is less American selling. Consumers are buying moderately, but there is more inquiry from some quarters.

The market for Tin Plate has been very quiet, with American demand especially slack. Makers, being sold well ahead on their production, are not pressing business, but outside sellers are more plentiful at somewhat easier prices, except for prompt delivery. A very fair business has been done in Charcoals at as high as 20/ for favorite brands.

Stocks of Old Iron are light, but holders seem anxious to sell, and prices are still weak.

Scotch Pig Iron.—There is no improvement in the demand, and very little change in the prices for the few brands offered.

No. 1 Coltness, f.o.b. Glasgow ..	..
No. 1 Summerlee, " ..	..
No. 1 Gartsherrie, " ..	..
No. 1 Langloan, " ..	..
No. 1 Carnbroe, " ..	51/
No. 1 Shotts, " at Leith ..	..
No. 1 Glengarnock, " Ardrossan ..	..
No. 1 Dalmellington, " ..	50/6
No. 1 Eglinton, " ..	50/

Steamer freights, Glasgow to New York, 2/; Liverpool to New York, 10/.

Cleveland Pig.—Business has improved somewhat, and prices are rather firmer at the close. Makers quote at 42/ for No. 3 Middlesborough, f.o.b.

Bessemer Pig.—Demand is no better, but sellers offer with greater reserve and hold for higher prices. Makers quote 52/6 @ 53/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Spiegeleisen.—There has been little doing the past week, and prices are nominal, with English 20 % quoted at 97/6, f.o.b. shipping port.

Steel Rails.—The market is unchanged. Orders come in slow, and makers hold for previous prices. Heavy sections quoted at £4. 15/ and light sections £5. 10/ @ £6, f.o.b. at N. W. England shipping point.

Steel Blooms.—Demand is still light, and prices are rather weak. Makers quote at £4. 10/ for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—No improvement in the demand, although offers are made at lower prices: Bessemer, 2½ x 2½ inches, £4. 10/, f.o.b. at N. W. England shipping point.

Steel Slabs.—Movement very slow and the market weak, with Bessemer quoted at £4. 10/, f.o.b. at N. W. England shipping point.

Old Iron Rails.—Demand continues light, and the market is still weak. Tees quoted at £3 @ £3. 2/6 and Double Heads £3. 2/6 @ £3. 5/, f.o.b.

Scrap Iron.—Sales are light, and the demand is no better. Heavy Wrought quoted at £2. 5/ @ £2. 7/6, f.o.b.

Crop Ends.—Very little doing, and prices still in buyers' favor. Bessemer, quoted at £2. 17/6 @ £3, f.o.b.

Tin Plate.—Few orders are coming in. Makers offer cautiously. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade.....	19/3 @ 19/6
IC Bessemer Steel, Coke finish....	18/ @ 18/6
IC Siemens " " " " " " " " " "	18/3 @ 18/9
IC Coke, B. V. grade.....	17/9 @ 18/
Charcoal Terns, Dean grade....	17/6 @ 17/9

Manufactured Iron.—Transactions have been on a more limited scale, and prices are without further change. We quote, f.o.b. Liverpool:

Staff. Marked Bars.....	£ s. d. 8 10 0 @ 8 15 0
Common " " " " " " " " " "	6 5 0 @ 6 7 6
Staff. Bk Sheet, singles....	7 2 6 @ 7 5 0
Welsh Bars (f.o.b. Wales)....	5 17 6 @ 6 0 0

Copper.—The market remains firm and demand is moderately active. Merchant Bars quoted at £53. 5/, spot, and £53. 7/6 @ £53. 10/, three months' futures. Best Selected, £58. 10/.

Tin.—Better demand for spots at the close and prices firm. Straits quoted at £90 @ £90. 2/, spot, and £90. 7/6 for three months' futures.

Lead.—More doing and the market firmer at £12. 10/ @ £12. 12/6 quoted for Soft Spanish.

Spelter.—Demand fair and the market firmer at £23. 15/ @ £23. 17/6 for Ordinary Silesian.

Cleveland.

(By Telegraph.)

Telegrams from the Mahoning Valley are to the effect that Foundry is so scarce that it is not to be had at any price. Bessemer Pig has risen in price, sales having been made at \$16.50, cash, at furnace. Mill Iron is strong at \$14.50 @ \$15 at furnace.

HARDWARE.

Condition of Trade.

THERE IS SOME complaint that the volume of business is not coming up to expectations, but there is still a fair trade doing. Some manufacturers report that orders are at present rather sluggish, but in other lines the demand is very satisfactory. Prices, as a rule, are without change. From nearly all parts of the country reports as to the business doing by the retail trade are satisfactory, but certain sections, for special reasons, report business below the usual volume.

Chicago.

(By Telegraph.)

Shelf Hardware jobbers report a better tone to trade, with considerably more business doing. It is a little early as yet for spring trade, but the indications now point to a heavy volume of business throughout this section. No special changes in prices are noted in this branch. In Heavy Hardware orders are getting better, and prices are firmer. Jobbers are being notified by the manufacturers that unless the Coke strike is soon settled they will be unable to guarantee deliveries of Iron and Steel on account of a scarcity of Pig Iron. Higher prices are consequently looked for. The demand for Wagon Stock continues very heavy. Jobbers say that their back order books have never been in such condition as at present, as they are unable to get the material for which they have outstanding contracts. Manufacturers' agents for Hardware specialties and staple goods make no complaint of the volume of business, but intimate that prices are not held closely up to the mark, and while there are no severe cuts, yet an occasional extra 2½ per cent. is conceded to secure an order that might go elsewhere. Brass Tubing and Sheets are weaker. Discounts have ranged from 25 to 30 per cent. for some time, but now 35 is given, and in largest lots even 40.

St. Louis.

(By Telegraph.)

There is no special change in the Hardware market; the volume of trade and prices continue about the same as last reported. The spring trade promises to be large, and jobbers are making preparations to meet it. Builders' Material is beginning to assume an active tone, and Shelf Goods are also selling in large quantities. Wire Cloth is in good demand. Cut Nails are slow to move at \$1.90. The demand for Wire Nails is light at from \$2.40 to \$2.45. Barb Wire moves freely at 2.85 cents for Painted, with 60 cents additional for Galvanized. Excessive rains in the South has curtailed business from that section, but the territory that is naturally tributary to St. Louis is of such dimensions, and is so thoroughly canvassed, that a curtailment of the trade from one particular section has little or no effect on the general volume.

Notes on Prices.

Barb Wire.—The market continues steady on a basis of 3.10 to 3.15 cents at mill for Galvanized Four Point in carload lots. While the demand is only moderate, manufacturers are not showing any disposition to make concessions in price, and the market has a fairly firm tone. Small lots from store are quoted at 3.35 to 3.45 cents for Galvanized, Painted being ½ cent less.

Chicago, by Telegraph.—Jobbers report a very fair demand, with considerable inquiry from parties who expect to buy shortly. Prices are unchanged at 2.75 cents for Painted and 3.30 cents for Galvanized, with 5 cents off for carloads.

Wire Nails.—In this line a very fair activity is reported, and it is evident that the mills are generally well supplied with orders, making them disposed to adhere firmly to prices. Quotations for large lots at mill are \$2.15 to \$2.20, some manufacturers being reported to hold at \$2.25. Small lots from store, \$2.45 to \$2.50.

Chicago, by Telegraph.—Manufacturers' agents now report a good demand for Wire Nails, with inquiries coming in for 1000 to 5000 kegs. With such a condition of trade, prices are held very firmly at \$2.25 to \$2.30, Chicago, but there are no immediate indications of an advance. Jobbers quote \$2.35 from stock, with 5 cents off in carloads.

Cut Nails.—The market is not particularly active, the demand being only fair. Prices without being especially firm are maintained on a basis of \$1.60 for round lots at mill, with 30 or 35 cent average. Small parcels from store in New York are held at \$1.85 to \$1.90 for Iron, carload lots, f.o.b. New York, being quoted at \$1.75 to \$1.80 for either Iron or Steel.

Chicago, by Telegraph.—Steel Cut Nails are moving very freely from manufacturers' hands. There are numerous inquiries for large lots and the mills are having a chance to fill their order books if willing to take the low prices now ruling. The Wheeling manufacturers quote \$1.60, at mill, on a 30-cent average, with special rates for higher averages. The Lake Side Nail Company completed their repairs and resumed operations on Monday. They quote \$1.75, Chicago, for usual averages. Jobbers quote Steel Nails from stock at \$1.85, with 5 cents off in carloads.

Strap and T Hinges.—There has been no change in the situation since our last report, the association prices being adhered to with the general adoption of the revised list. Roy & Co., Troy, N. Y., are, however, not in the association, and are still using the old list. A revised list has also been adopted by the Stanley Works, New Britain, Conn., and 79 Chambers street, New York, on their patent Corrugated Hinges and on Hart's Patent

Hinges. These lists are printed below, and are subject to the regular discount of 50 and 10 per cent.:

Corrugated Steel Heavy Strap Hinges.

Size, inches....	4	5	6	8	10
Per doz. pairs..	\$0.80	1.00	1.50	2.30	3.45

Corrugated Steel Extra Heavy T Hinges.

Size, inches....	5	6	8	10
Per doz. pairs..	\$1.35	1.70	2.80	3.80

Hart's Patent Light Strap.

Size, inches....	6	8	10	12
Per doz. pairs..	\$1.15	1.70	2.30	3.80

Hart's Patent Heavy Strap.

Size, inches....	4	5	6	8	10	12	14
Per doz. pairs..	\$1.00	1.25	1.75	2.85	4.25	6.00	7.50

Hart's Patent Extra Heavy T Hinges.

Size, inches....	5	6	8	10	12	14
Per doz. pairs..	\$1.70	2.10	3.35	4.85	7.00	8.30

Hart's Patent Trunk Hinges.

Size, inches....	5	6
Per doz. pairs..	\$1.00	1.15

Well's Patent Heavy Strap Hinges.

Size, inches....	5	6	8	10	12	14
Per doz. pairs..	\$1.25	1.75	2.85	4.25	6.00	7.50

Well's Patent Extra Heavy T Hinges.

Size, inches....	5	6	8	10	12	14
Per doz. pairs..	\$1.70	2.10	3.35	4.85	7.00	8.30

Glass.—The Glass market has not recovered from the depression in price which followed immediately upon the failure of the American Window Glass Company to become a working organization. The demand for Glass is light, which is not unusual at this season of the year. This condition of the trade, coupled with the large stocks of Glass in jobbers' hands, is causing manufacturers who are in need of ready money to make concessions in prices for spot cash, the goods to be delivered in the future. There are no indications which would justify the supposition that there will be any immediate improvement in the price of Glass. The feeling seems to be quite general among jobbers that the accumulations of stocks are sufficient to supply the demands for early spring trade at least, and until these are exhausted prices can be made to a great extent by cash purchasers.

Miscellaneous.—Cincinnati Tin and Japan Company, Cincinnati, Ohio, are selling their new Coffee Pot, a description of which we gave in our last issue, at the following prices:

Quarts.....	2	3	4
Per dozen.....	\$1.75	2.00	2.25

Lamps.—Craighead & Kintz Company, Ballardvale, Mass., announce reduced list prices on some of their Daylight Lamps.

Self-Lubricating Sheaves.—Boston and Lockport Block Company, Boston, Mass., and Lockport, N. Y., quote their regular Mortise Blocks with Ford's Patent Self-Lubricating Sheaves at 50 per cent. discount from the association list. A description of these Sheaves is given in another part of this issue.

Wringer Consolidation.

The negotiations which have for some time been in progress between the Bailey Wringing Machine Company, F. F. Adams Company, Metropolitan Mfg. Company and the Empire Wringer Company have been concluded. The result is a consolidation of these companies. Application has been made for a charter for the new corporation.

Trade Items.

UNDER DATE February 18, Walbridge & Co., Buffalo, N. Y., announce that they are now in shape to resume business, which was so suddenly interrupted by the fire which destroyed their building and its contents on January 18. They have secured the stores 102 and 404 Seneca street, which are commodious and convenient, and which they will continue to occupy during the interval necessary for the rebuilding of their establishment on the old site. The firm state that they have got in a complete stock and are able to offer their customers the advantages of perfectly new and clean goods, referring also to the fact that their prices will compare favorably with those of their competitors.

MILLSPAUGH & DRAKE of Corning, N. Y., have purchased the old-established Hardware business of M. D. Walker & Co. The new firm would be glad to receive from manufacturers catalogues and discount sheets relating to their goods.

KIDD STEEL WIRE COMPANY, Harmarville, Pa., manufacturers of Square, Hexagon and Octagon Drill Rods, advise us that they have made no advance in prices, though the list of imported Rods has been advanced. They have given orders for new machinery, which, when in place, will increase their capacity about one-third.

A CONSOLIDATION of the interests of D. H. Jerome & Co., Saginaw, Mich., and M. R. Manhard of Marquette has been effected, and articles of agreement have been signed by Mirza R. Manhard and David H. Jerome, Edward I. Peck and Edward A. Moye of the firm of D. H. Jerome & Co., organizing the Manhard Hardware Company, Marquette, Mich., with a paid-up capital of \$60,000. The new company will do a wholesale and retail Hardware business, occupying the Manhard block on Front street and a two-story stone warehouse on Lake street. They will carry a large and varied stock, a specialty being made of Mill and Mining Machinery and Hardware. The main salesroom will be 60 x 80 feet, and will be attractively arranged. The new company will begin business on or before May 1, the delivery of stock being made in April. They will put one or two traveling men on the road from the start.

IT IS ANNOUNCED by Jacob A. Cantor, receiver of the Medford Fancy Goods Company, 44 and 46 Duane street, New York, that the business will be continued as usual under an order of the Court and orders will be promptly filled. No change will be made in conducting the manufacturing part of the business, and it is intimated that no difficulty need be anticipated by any of the company's customers.

THE ANNUAL ELECTION of the Sieg Iron Company, Davenport, Iowa, was held recently, and reports were presented testifying to the prosperous condition of the corporation and the gratifying business done during the past year. The firm was founded in 1869 by R. Sieg and A. F. Williams, and has from the first conducted a wholesale business. The capital was about \$20,000. With the large increase of their business it became necessary to vacate the old quarters, and in August of 1875 the firm removed to the commodious building which has since been the scene of their operations. The building is situated on the corner of Third and Main streets, and covers an area 43 by 150 feet, three stories high, with a large basement. With the further extension of the company's trade it became necessary to purchase two lots, on which were erected large warehouses and sheds for the storage of the Hard Wood, Lumber and Wagon Stock carried by the house, and which could not

be accommodated in the regular establishment. In 1887 Mr. Williams died, and subsequently the interest of Mrs. Williams was purchased by his surviving partner and the Sieg Iron Company was formed. The style of the company has since been unchanged, notwithstanding the death of Mr. Sieg several months ago. The paid-up capital of the corporation is now \$90,000, and much of its success has been due to intelligent methods and the care and skill with which the business has been conducted.

THE FIRM of Smith Bros., Delaware, Ohio, has been organized as a stock company under the style of the Smith Bros. Hardware Company, the new enterprise being located at Columbus, Ohio. The company will conduct only a wholesale business. They have a double storeroom, 38 x 100 feet, four stories and basement, situated on East Spring street, a short distance from High street. A roomy alley in the rear of the building provides facilities for the loading and unloading of goods. Chutes will carry goods from dray to basement, and an elevator will secure easy communication with the upper floors. The sample room will be on the first floor of the establishment.

OUR READERS will be interested in the Special Notice on page 56, in which a large assortment of English and German Cutlery is offered for sale in connection with similar goods of American manufacture, this stock having been formerly the property of Gilbert, Sweet & Lyon (in liquidation), 33 Chambers street, New York. John A. Gilbert is now offering the entire lot for sale at large reduction from regular prices.

STANLEY RULE AND LEVEL COMPANY, 29 Chambers street, New York, are sending a circular to the trade referring to improvements on their present lines of Labor-Saving Carpenters' Tools. Attention is directed in this circular to their latest method of lateral adjustment now attached to Bailey's Patent Adjustable Planes, securing a sidewise adjustment independent of the forward and backward adjustment of the cutter. They are now sending out the No. 45 Beading, Rabbet and Slitting Plane and No. 71 Router Plane both nickel-plated. Reference is made to the popularity of their Patent Duplex Tools, Roofing Brackets, Hand Beaders, Odd Jobs, Clapboard Tools, Level Sights, &c., as indicated by the demand for the same.

C. W. Hackett Hardware Company.

C. W. HACKETT HARDWARE COMPANY, St. Paul, Minn., have recently taken possession of their new building erected for their special use and situated on the southwest corner of Fourth and Rosabel streets. The building is regarded as the most notable business improvement in St. Paul during the year 1890. In connection with a description of their new establishment it may be interesting to note something of the history of this well-known house. In 1873 the firm was known as Strong, Hackett & Chapin and had a capital of \$50,000, its situation at that time being on the lower side of Third street, between Jackson and Sibley streets. Mr. Chapin died in 1878 and the firm became Strong, Hackett & Co. In 1880 business had so much increased that more room was needed, and in January, 1881, a change of location to Fourth street, between Sibley and Wacouta, was effected. In these quarters the business was conducted for a decade. In 1885 the Strong-Hackett Hardware Company were incorporated, with a paid-up capital of \$300,000, at which figure it remains to-

day. In 1889 C. W. Hackett bought out the interest of Mr. Strong, the company then adopting the present name—the C. W. Hackett Hardware Company. Of this company C. W. Hackett is president and exercises a general and active supervision; T. G. Walthers is vice-president and looks after the purchasing of goods; H. B. Gates is treasurer and keeps track of the credits and finances; M. L. Merrill is secretary and in charge of the sales department, and J. C. Henry, assistant treasurer, looks after the large Sporting Goods department. These gentlemen are the directors of the company. Mr. Hackett was the second president of the Jobbers' Union and has been for years a prominent merchant of St. Paul.

The business of the company in 1890 showed an increase of 25 per cent. over the previous year, and more room and better facilities were imperatively demanded. In July, 1890, Mr. Hackett purchased the lot on the corner of Fourth and Rosabel streets, and on the 25th of August following work on the foundations was commenced. Work on the superstructure began October 25, 1890, and on February 1 of this year the company were ready for business in their new quarters.

The new building is massive in proportions and slightly in design. It occupies 100 feet on Fourth street by 130 feet on Rosabel, has five stories and a basement, is built of brick, iron, steel, stone, terra cotta and wood, and can be reached from the street on three sides. Its cost was about \$100,000. Clarence H. Johnston, the architect, says the building is the strongest of its kind in the city, and more than capable of standing the weighty stock assigned to its keeping. The foundation is on piles of thick concrete with massive stone piers, and the general construction is known as the Mills slow-burning. There is an unusual quantity of light during the hours of sun, and dark corners are unknown, even the basement being different from the caves of gloom one generally sees beneath our large blocks. There are two elevators, run by electric motors, which also supply the artificial light needed. The shipping is done from the south half of the building, opening directly into the court leading to Rosabel street. In the basement proper, which is enlarged by taking in the width of the sidewalk, are stored such heavy materials as Nails, Fencing Wire, Sheet Iron, Tin Plate and the like. The first floor, entered from Fourth street, is particularly light, cheerful, commodious and well arranged. Along the Rosabel street side are ranged the offices. There is plenty of clerical work, as the company employ 80 persons, including 15 traveling men. President Hackett's office is in the corner fronting Fourth street. The city sales are conducted on this floor, and here, too, is stored the stock of Shot Guns, Rifles, Fishing Tackle, Ammunition and Sporting Goods in general. Cutlery and samples here find place also, and the arrangements are all as complete as they are convenient and ample. On the second floor are Shelf Goods in long lines, and here the outside orders are packed for shipment. On the third floor are found Tinware and General House-Furnishing Hardware, the idea, of course, being to put the heavier articles on the lower floors and the lighter ones on those above. On the fourth floor are Hand Agricultural Implements, such as Shovels, Spades, Hoes, Rakes, Axes, Tinners' Tools, &c., and on the fifth the lighter Wooden Wares, such as Wheelbarrows, Churns, Fancy Tools, and the like. The arrangement, made possible by the admirable facilities afforded by the new building, is as convenient as could be desired.

The new building secures for the company about double the room that was at their disposal before the removal. They

advise us that business generally is in a very prosperous condition. The borders of the territory from which St. Paul draws its business are continually extending, and the market is consequently growing in importance. The trade outlook for the year is regarded as very promising—more so than any one of the last five years.

Lawn Mowers.

THE GENERAL IMPRESSION which prevails among manufacturers of Lawn Mowers, in regard to the outlook for business, would indicate that the prospects are for a very large output of these goods for the coming season. Last year proved to be an exceptionally good one for these goods, and the large trade which the dealers enjoyed has resulted in the placing of heavier stock orders for spring shipment than are usually given. Each year shows an increase in the number of so-called cheaper machines on the market, which naturally has a tendency to lower the price of this class of Mower. There appears to be little change, however, in the prices of the well-known high-grade machines. The reason for this is probably due to the fact that where a machine has proved good and given satisfaction dealers are loth to change even if offered a new machine at quite a reduction in price. The export trade is also increasing in a satisfactory manner, as the Mowers manufactured here have given almost universal satisfaction in foreign countries, even where the conditions are more trying than on American lawns. The prospect, therefore, is that a larger quantity of Mowers will be sold during 1891 than in any previous year. The following information in regard to the Machines of some leading makes may be of interest:

CHADBORN & COLDWELL MFG. COMPANY, Newburgh, N. Y., will have on the market for the coming season, the Excelsior Roller, New Model, O K, New Model High Wheel and New Excelsior Horse Lawn Mowers. The O K Mower is intended to meet the demand for a Lawn Mower for door yards and small lawns that will do good work, and that is not liable to break or to get out of order. Attention is called to the cutter frames, also to the manner in which the side frames are fitted into the driving wheels, to exclude the grass and dirt from the gears. The New Model High Wheel is especially adapted, as its name indicates, for cutting higher grass than the ordinary Mower does.

SUPPLER HARDWARE COMPANY, Philadelphia, Pa., have on the market for 1891 the Pennsylvania, Continental, Great American and New Quaker City Lawn Mowers. The manufacturers state, in reference to the Pennsylvania and Continental Mowers, that the cost of manufacturing these is from 15 to 20 per cent. greater than that of similar sizes of ordinary style Mowers. They, however, look for no diminution in the sales of these Mowers owing to the difference in price. The Great American and New Quaker City Mowers are cheaper machines, for which the manufacturers claim that they are constructed in the best manner, with the same patent corrugated cylinder knives that are used on the Pennsylvania and Continental Mowers; that the bearings are long, causing little friction and insuring ease of working; that the material and finish are the best; that these machines embrace the patent yielding dead knife, which is so adjusted that

it touches the revolving cutter all the time, causing it to be self-sharpening. The Pennsylvania and Continental High-Wheel Extra-Large Cylinder Lawn Mowers are designed for large grounds, either with the finest lawns or with rough or unwieldy grass, wild undergrowth or irregular grounds; to cut the grass where 6 to 10 inches high, or grass but 2 to 4 inches high. The Pennsylvania Horse Lawn Mowers are made with both open and closed cylinder.

ENTERPRISE MFG. COMPANY, Philadelphia, Pa., as a result of their experience of the past three years, have made important improvements in their Enterprise Lawn Mowers for the trade of 1891. They will make the improved Mowers in two styles—viz., with three and five blades respectively. Instead of using the high list prices and large discounts which other manufacturers have been using and giving, they have adopted a new list, which will be subject to the same discounts as they allow on their general line of specialties, the net prices of which will correspond with those of other manufacturers.

GRAHAM, EMLEN & PASSMORE, Philadelphia, Pa., will offer the trade for the coming season their line of Lawn Mowers under the general name of the Philadelphia. The hand machines are made in styles D, M, S and L. The style L is a new high-wheel Mower, having a four-blade riveted steel wiper $6\frac{1}{2}$ inches in diameter, furnished with their new corrugated spiral blades, which are designed to admit of the face of the blade being quickly filed to an edge when battered. They also make Pony and Horse Mowers from 30 to 36 inches. The Philadelphia Grass Edger is referred to as a great labor saver on a well-kept lawn. The Philadelphia Hand Lawn Sweeper sweeps 24 inches wide, and the Horse machine sweeps 40 inches wide. These are intended for sweeping the lawn after the grass has been cut.

BLAIR MFG. COMPANY, Springfield, Mass., are offering their Bay State Mower unchanged from last year, as they are unable to see where this style of machine can be improved. They are putting out their Easy Mower, however, entirely reconstructed, and the Easy will be put on the market with especial confidence in its merit.

THE ROGERS FENCE COMPANY, Springfield, Ohio, manufacture the Superior Lawn Mower. It is a front-cut machine, the reel knives being protected by a guard to prevent them from cutting shrubbery, &c. It is stated that the ratchet or pawl has no spring, makes scarcely any noise, has eight catches in a circumference of 3 inches, so that the reel starts to cutting the moment the machine is started forward. The point is made that the double gearing gives it ease of motion, combined with strength, enabling grass to be cut rapidly when going at a slow rate of speed. The manufacturers claim that in a moment the Mower can be adjusted to cut grass from 1 inch to 12 inches high.

SPRINGFIELD IRON WORKS, Springfield, Ohio, will continue the manufacture of the Prince Lawn Mower for the season of 1891. The manufacturers claim that the flexible handle is so arranged that a child or adult can operate it with ease; that the adjustable roller regulates the cut for short or high grass; that it has a positive fore clutch, the pawl of which will not stick; and that the cutter bar is adjustable, also the boxes or caps, enabling any wear that may occur in the shaft to be taken up.

DILLE & MCGUIRE MFG. COMPANY, Richmond, Ind., the S. A. Haines Company, 90 Chambers street, New York, agents, are manufacturing for the season 1891 the following Lawn Mowers: Diamond, Diamond High-Grass, Crown, Western and Star. Also the Handy Clipper, for cutting and trimming the edges of lawns. The Diamond is a Four-Blade Reel Lawn Mower, made in five sizes, from 10 to 15

inch cut. The Diamond High-Grass Mower is made in four cuts, from 16 to 24 inches. The wheels are $10\frac{1}{2}$ inches high and the cylinder $8\frac{1}{2}$ inches in diameter. The manufacturers refer to their Crown Mower as strictly a high-grade machine, made expressly for export. This is made in five cuts, from 10 to 18 inches. In presenting the Western Mower attention is directed to the manner of adjusting the cutting cylinder to and from the lower stationary bar; also to the positive-acting silent Ratchet. The Richmond Star Mower is designed as a light and easy-running machine, with a noiseless ratchet, with the driving wheel arranged to run always on the cut, not on the standing grass.

THE THOMAS MFG. COMPANY, Springfield, Ohio, will have on the market for the coming season the Thomas Lawn Mower in five sizes, to cut from 10 to 20 inches. It has a front rod, allowing the grass to be cut close to trees, shrubbery, &c., without injury to them.

Up or Down?

IN OUR ISSUE of February 5 we illustrated two tiers of shelving, as shown in Fig. 1. Accompanying this was an inquiry from a correspondent whether after the first tier of shelving is filled the remaining sizes of the same class of goods should be from the top of the next tier down or from the bottom of the next tier up. The question was submitted to our readers, from a number of whom we have received replies. We take pleasure in giving these in part, as they suggest the different ideas of arrangement which are followed in different localities. A prominent retail firm from Boston refer to the matter in the following terms:

In regard to the disputed point, we should say that the rule should be to begin at the top with the lighter sizes and work down, continuing through each section in exactly this order. We should not call it good system any other way. It should be the rule to keep the heavier and larger goods at the bottom.

They refer to the favorable impression that this arrangement of their shelving produces upon traveling salesmen, also the ease, safety and economy with which it enables them to carry on their business.

A firm in Cincinnati who do a large business in Shelf and Heavy Hardware think that the proper way of arranging goods on shelving would be that after the first tier is filled from top down to begin on the top of the next tier to the left and work down, the same plan being followed as in reading a book or paper.

A well-known Missouri Hardware house state the case in this way:

The inquiry is perhaps a hard one to answer until a person has tried both ways. I find that from the next tier down is more convenient for the following reasons: In looking at a tier of shelving you know instantly which way to look for what is wanted, as every tier is from top to bottom, while in the other arrangement you must first study which way the tier runs and then follow it. The pages of a book all read from top to bottom, and I think it is more convenient than to have every other tier read up.

A merchant in Wisconsin, who carries an extensive stock, gives his experience in arrangement of shelving as follows:

I think in case of Wrought Butts, or any other shelf goods, the remaining sizes

should be placed from the bottom of the next tier up, as I have them in my store. I find it more convenient to place them that way, as it is easier to handle the large sizes on the bottom shelves than it would be on the upper ones.

From Minnesota a leading and long established Hardwareman writes:

While the following does not directly decide the point at issue, it may be of assistance in its determination: Should not the governing consideration be vitality, and the arrangement be made with a view to have the number or sizes most frequently in demand on the most readily accessible shelves? Although uniformity in such matters is exceedingly desirable, I doubt if any cast-iron rule can be adopted in the arrangement of stock of so diversified a character and size as is found in the ordinary Hardware store without too great a sacrifice of space, economy and convenience to method.

A gentleman from Indiana, who has given the arrangement of Hardware stocks a great deal of attention for a number of years, does not see any other way than to begin at the top of the second tier and work down:

If the other arrangement were followed, that is, from the bottom of the second tier up, and there were more sizes than could be accommodated in the second tier, how would the remaining stock be placed in the following tier? Or if, as shown in the cut in your issue of February 5, the Wrought Butts should only require a part of the second tier at the bottom for their accommodation, should the remaining space in this tier, being given to Casters, be arranged in the same order as the lower part, or should it conform to the first tier in arrangement? The arrangement from bottom up in the second tier would result in a confused stock and destroy all uniformity of arrangement throughout the entire store. A Hardwareman should be able to put his hand on anything he wants from stock in the dark, which cannot well be done with mixed arranged shelving.

A member of a large Baltimore firm favors us with a plan of arrangement, as indicated in the accompanying illustration, which we give for a clear understanding of his method. After referring to the question under discussion, he says:

On this point I would simply say, if compelled to follow one of the two courses laid down in your paper I should trim my shelves from the bottom up, and give as my sole reason that if you seek uniformity you are compelled to take this course, as it is the only one which will be uniform, as the two tiers will then be filled uniformly from top to bottom. Pardon me, however, if I venture the assertion that the whole plan, as shown in your cut of February 5, is wrong. Not to leave my assertion unbacked by facts I will, if you afford me space, give the reasons for my position. In the outset let me say that we will talk of stores fitted out with wooden boxes, of various sizes (in the retail department), in all of our following arguments. In the case given in yours of February 5, Butts are taken as an example, therefore I will also speak of Butts, though the same rule applies to any line of goods where there are a great many sizes and styles, such as Bolts, Bright-Wire Goods, Casters, Screws, &c.

To trim the shelves, as given in Fig. 2, the sizes should have commenced at the bottom at left-hand corner and run across the tiers, then back to the left-hand corner of next higher shelf, and thus on all the way up. We thus keep the most saleable goods as low down as possible on the

shelves, thus obviating many trips up the store ladder. Our reason for running our goods from left to right is that the hand as well as the eye works better from left to right than vice-versa. When we arrange a line of goods that are not so continually called for we run straight up a single tier of shelving, smallest articles on bottom row of shelving, largest on top. Now, such a line with us is Casters. We carry 87 styles and sizes. This means 87 boxes, some large, some small. We commence at the bottom shelf with Plate Casters at left-hand corner, work to right-hand corner, then back to left-hand corner of next upper shelf, and follow same

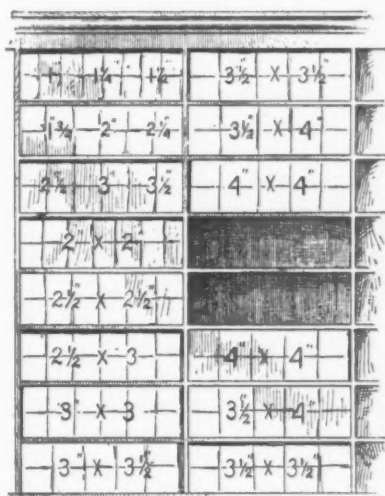


Fig. 1.—Arrangement of Goods in Shelves.

course as on lower shelf. Plate Casters are followed by Philadelphia Casters, these by Anti-Friction, and last comes largest of all. Bed Casters, thus giving smallest boxes and smallest articles on bottom rows, and largest articles and boxes on top rows of shelving.

The question arises, Why put smallest articles and boxes on bottom rows and vice versa? My answer is given with two good reasons: 1. As the goods are sampled on boxes to facilitate sales and help customers in finding what they are

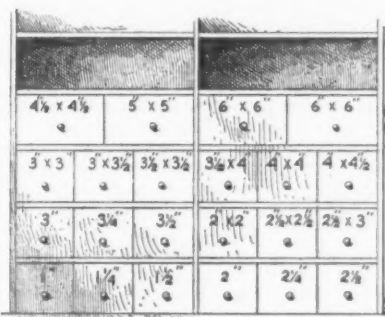


Fig. 2.—Arrangement of Shelving by a Baltimore Firm.

in search of, the small articles, being on bottom rows, are nearer the eyes and consequently more easily discerned, and it follows, naturally, that sales are increased and facilitated. 2. In shelving made 12 inches high and 36 inches wide you can accommodate 48 boxes 3 x 3 (our small size); same shelf accommodates 12 boxes 6 x 6 (next to largest size), which means if small boxes are on top rows just 48 trips up the ladder for one purchase from each box, while if large boxes are on top means only 12 trips up the ladder for one purchase from each box, thus saving three-fourths the labor by putting these small boxes at bottom. I think, then, my posi-

tion is well sustained in trimming shelves from left to right, with small sizes at bottom and large at top. Aside from these theoretical reasons, I have another and more potent one; it is the general effect produced by the above style of working. We follow it in our store, and every one, salesman from other cities, customers and friends, are always complimenting us on the beauty, regularity and generally fine appearance of our store.

We are gratified at the number of our readers who have responded to this inquiry, and we should be glad to hear from others on the subject. Perhaps there is some better plan than any that has yet been presented.

Price-Lists, Circulars, &c.

McMULLEN WOVEN WIRE FENCE COMPANY, Chicago: McMullen Woven-Wire Fencing, All-Steel Fencing, Woven-Wire Gates, Poultry Netting, Cemetery-Lot Fencing, &c. Their small catalogue has a pocket on the inside of the back cover for carrying memoranda.

WILLIAM LYMAN, Middlefield, Conn.: Lyman's Wind-Gauge Sight, Gun Sights and Rifles. The optical principle involved in these Sights is referred to as new in its application. When aiming, this Sight has the appearance of a ring or hoop, which shows the front sight and the object aimed at without intercepting any part of the view. It is stated that the great feature of this Sight is that the eye is guided without any change of focus or effort to see more than is seen when shooting without a rear sight. These Sights are arranged for many different makes of rifles.

CHARLES H. CHILDS & Co., Utica, N. Y.: The Childs Perfect Chilled Plows, right and left hand; Vineyard or Garden Plow, U. T. K. Mounted Grindstones, Angle Steel-Frame Spring-Tooth Harrows, Cultivators, Hillers, &c. The legs of the Mounted Grindstone frames are wrought iron, the hangers are malleable iron, painted black; the wood beams and treadle are painted bright vermilion. It is stated that the malleable shafts will interchange with any stone. These are shipped knocked down in three parts, viz., stone, wood and irons.

W. H. COLEBROOK & Co., Syracuse, N. Y.: Black Flag Stove Polish, Crown Paste Stove Polish and Crown Stove Lining. Referring to the Black Flag Stove Polish the manufacturers state that they are enabled to supply the trade with even better goods in more desirable packages than heretofore. The Black Flag is manufactured for water and also for benzine.

WATERBURY RUBBER COMPANY, 49 Warren street, New York: Sphinxer Grip Galvanized Spring Steel Armored Hose, for water, air, steam, acids, oils, liquors, gas, suction, &c. The manufacturers state that much Hose is destroyed by the sudden concussion through kinking, and that their Hose cannot be kinked. The point is made that this Hose and Armor can be cut at every wind of the wire without loosening or uncoiling, and that it is more flexible than unarmored Hose.

C. C. ECHOLS, Granger, Texas: The Texas Sweep Stock. The feature of this implement is a Rudder running from the foot of the plow back, being attached to an upper bar. The Rudder has an adjustable steel knife attached, set vertically. This Rudder is adjustable, designed to set the plow various depths, from 2 to 10 inches, without changing the back band or traces.

ANDERSON, DU PUY & Co., Pittsburgh: Pa.: Saw, Sheet, Safe, Spring, Cutlery, Plow and Machinery Steel, Forgings, &c. A specialty is made of Keystone brand of Tool Steel, also Hammond and Rolled Steels and Coil Springs of all

descriptions for agricultural implements. Forged Steel Wrenches for from $2\frac{3}{8}$ to $5\frac{1}{4}$ squares, Bit Shank, Pin and Box Blanks, Crank Shafts, Wrench and Crow-bar and other forgings forged to sketch.

WM. STAIRS, SON & MORROW, Halifax, N. S., Heavy and Shelf Hardware, Fishing Materials, Vessels' Outfits, &c., issue a calendar for 1891. It is a card 14×18 inches, with metallic end and loop, with calendar sheets of the same size attached at the bottom.

L. A. WEYBURN COMPANY, Rockford, Ill.: Ideal Specialties. Ideal Lister Share, Fire Colter, Landside Holder, Plowshares, Plow Point, Landside Plate, Landside Point, Cultivator Shovel, Cultivator Shovel Point, &c. Special attention is called to the Ideal Ribbed Plowshare.

THE ROLAND PLOW WORKS, Baltimore, Md.: Roland Chilled Plows, the Damascus Plows, Farm and Church Bells. This firm and their predecessors have been in this business nearly 50 years, and have patterns, they advise us, for most of the Plows sold in the South during that time, and a large portion of their business is furnishing repairs for these Plows. They also manufacture the Young America Corn and Cob Mills. The grinding plates of these Mills are referred to as being made of steel, which can be easily renewed at a small cost.

WESTERN HARDWARE CO., Chicago: Curling Irons, Pinching Irons, Tracing Wheels, Cork Screws, Ice Shaves, Nut Crackers, Stove Pokers, Lid Lifters, House Numbers, Box Hooks, &c. Illustrations and list prices are given.

WALTER A. WOOD MOWING AND REAPING MACHINE COMPANY, Hoosick Falls, N. Y.: Binders, Mowers, Rakes, Reapers and Harvest Machinery. Two-horse Mowers of four widths, One-horse Mowers of one width, Binding Harvesters of three widths, Bundle-Carrier for Binding Harvester, Transport-Truck for Binding Harvester, Flax and Clover attachment for Harvester, Reaper of one width, and Hay Rakes of three widths.

JOHN S. CARTER, Syracuse, N. Y.: Apparatus and supplies for Cheese Factories, Creameries and Dairies. Creamery King Boiler and Engine, Stationary Boilers, Steam Pumps, Force Pumps, Pulleys, Hangers, Shafting, Steam Pipe and Fittings, Steam Turbine Separators, Cream Vats, Butter Workers, Milk Cans, &c.

F. E. BRIGGS, Deering Center, Maine: Tinware, Stamped and Japanned Ware. Iron Ware, Wire Goods, &c. Pieced Ware Pans, Pans, Straight and Flaring, Dinner Pails, Chamber Pails, Coffee Pots, Milk Cans, Oil Cans, Oyster Cans, Sealed Measures, Cake Cutters, Pieced and Stamped Dippers, Sprinklers, Steamers, Tea kettles, &c. Special attention is directed to his Sap Buckets. The quality of the Tinware is referred to.

THE KNAPP & COWLES MFG. COMPANY, Bridgeport, Conn.: Hardware and House-Furnishing Goods, Screw Drivers, Reamers, Countersinks, Cold Chisels, Washer Cutters, Tack Hammers, Tack Claws, Box Scrapers, Garden Trowels, Garden Sets, Ice Chisels, Mincing Knives, Door Checks, &c. Many new styles of goods are shown, with additions to their former lines. Particular attention is directed to their large line of Screw Drivers, comprising many new styles, which goods are referred to as being forged from a special grade of steel made expressly for them, great care being taken to secure a reliable and uniform temper in them. Mincing Knives and a new line of Garden Floral Tools are made a prominent feature in their catalogue. The manufacturers state that with improved machinery and increased facilities they are enabled to maintain their standard quality in all their goods, and to fill orders promptly.

ST. LOUIS REFRIGERATOR AND WOODEN GUTTER COMPANY, St. Louis, Mo.: Catalogue No. 1, Centennial Refrigerator, Side-

board Refrigerator, Ice Chest, Grocers' Chest, Wine Coolers, Cedar Chests, Butler's Tray, Beer Coolers, &c. Catalogue No. 2, Children's Carriages. These are shown in reed bodies, both light varnish finish and bleached, also in willow bodies. The cushions are interchangeable; the wire wheels have malleable hubs, cast entirely of one piece; the spokes are cast firmly to the hubs which are cast hollow and filled with anti-friction metal. Catalogue No. 3, Toys, Doll Cradles, Doll Perambulators, Solid Hard-Wood Toy Furniture, Toy Wagons, Rocking and Swinging Horses, Velocipedes, Tricycles, Lap Boards, &c. Catalogue No. 4, Kitchen Safes, Wardrobes, Beds, &c.

D. R. SPERRY & CO., Batavia, Ill.: Cal-drons, Baker's Oven, Sugar Kettles, Hollow Ware, Laundry Stoves, Farm Boilers, Mauls, Coffee Roasters, Bake Ovens, Drug Mortars, Felloe Oilers, Foundation Gratings, &c. They also do special work for packers, chemical, varnish, soap, oil and other manufacturers, for which they state they have many special facilities, as well as experience, for executing special work. The second edition of their 1890-91 catalogue contains illustrations and descriptions of their goods.

E. BEMENT & SONS, Lansing, Mich.: Implements for the farm and garden. Plows, Shovel Plows, Scratchers, Cultivators, Cultivator Blades, Harrows, Scrapers, Southern Steel Shapes, Bob Sleds, &c. These goods are made in a variety of styles and sizes suitable for requirements in different sections of this country and for the export trade.

BROWN, MCCLURE & WALES, Boston: Boston Excelsior Upright Drill. This machine is designed for light drilling. The diameter of the spindle is $1\frac{1}{8}$ inches, and 10 inches long. The entire length of drill is 40 inches, weight 85 pounds. The manufacturers claim that it will drill a hole to the center of a 10-inch circle, 2 inches deep.

BUCKEYE MFG. CO., successor to J. H. Osborne & Co., Union City, Ind.: Star, Acme, O K and Model Adjustable Neck Yoke Centers; Star, Acme, Perfection, O K and Model Neck Yokes; Waterhouse Neck Yoke Lock; Improved and Patented Carriage Pole; Adjustable Self-Centering Carriage Pole; Finished Shafts; Martin's Singletree and Doubletree Clips; Spiral Spring Buggy Wrench; Ansbourne Jack; Pole and Shaft Straps.

EDWIN PRESCOTT, 21 Hamilton street, Boston; Parker & Wood, agents, 49 North Market street, Boston: I X L Standard and Peerless Wagon and Carriage Jacks; Prescott & Mann Cattle Stanchions. The superiority of this Stanchion is referred to as consisting in the manner in which it fastens the cattle while in the barn. It is stated that when a cow is lying down the Stanchion allows her to move forward as she naturally desires to, giving her 5 inches more available floor space than she has when standing, thus allowing her to lie comfortably, with her hind quarters fully supported on a clean, dry floor. Also that the turning of the Stanchion admits of an easy and natural position of the head at all times.

MCCRAY REFRIGERATOR AND COLD STORAGE COMPANY, Kendallville, Ind.: Pamphlet of 32 pages describing McCray's Patent Cold Storage and Cooling Rooms. This company make a specialty of Cold Storage Houses for all purposes. In the pamphlet referred to their system of refrigeration is described in detail, being illustrated with cuts showing sectional views, etc. They aim to secure a thorough circulation of air, regarding that as of more importance than the mere presence of cold to complete a perfect preservation. They claim that there is no Refrigerator built which, with the same temperature and like conditions, will use as little ice and give the same benefit. It never becomes musty, and is always free from foul air. The first large cold storage warehouse on the McCray system was built in 1881, has been in constant use ever since,

and is as dry to-day as when first constructed. The company will build any size that may be wanted for holding fruit, vegetables, butter, eggs, cheese, creameries, &c. A large number of testimonials are given from those who have the system in operation.

THE MATCHLESS METAL POLISH COMPANY, 82 to 88 South Market street, Chicago: Circulars relating to Buffing Compositions and Metal Polishes. The company make a specialty of the White Diamond Buffing Compositions, graded X, XX and XXX. The first grade is for swift, sharp cutting; the second for soft metals and delicate work, and the third for coloring only, taking the place of rouge for that purpose. The circulars fully set forth the merits of other polishing compositions made by the company, and reproduce numerous testimonials to their excellence from most reputable sources. They have enjoyed a largely-increasing trade during the past year, both at home and in foreign countries.

CINCINNATI BARBED FENCE WIRE COMPANY, Cincinnati, Ohio: Steel Wire Nails, Barbed Wire, Galvanized and Plain Fence Wire, Staples and Fencing.

L. M. RUMSEY MFG. COMPANY, St. Louis, Mo.: Belting, Hose, Packing, Shafting, Pulleys, Hangers, Couplings, Link Belting, Wire Rope, Tackle Blocks, &c. This is the first section of a general machinery catalogue, No. 61, to contain some 700 pages. The other sections will be issued from time to time, devoted to different branches. This will enable them to supply their customers with sections devoted exclusively to any one particular branch of the business shown in the general catalogue.

THE CHICAGO STAMPING COMPANY, 10 to 14 Lake street, Chicago: Illustrated circular of new and seasonable goods. This is a finely-illustrated 48-page catalogue of Challenge Iceberg Refrigerators, White Mountain Ice-Cream Freezers, Summer Queen Oil Stoves, Bird Cages in great variety, Water Coolers, Jewett Climax Filters, Eave-Trough Hangers, Wire Cloth and Window Screens, Perfection Filter Coffee Pots, Dust Pans, Can Openers, Oil Cans, Flue Stoppers, Mincing Knives, Rudolph's Fishing Specialties, Milk Cans, Dairy Specialties, &c. The display of Refrigerators shown in this catalogue is particularly rich in styles and designs.

HINE & ROBERTSON, 45 Cortlandt street, New York: Standard Hydraulic Valve, Robertson's Exhaust Oil Extractor, Ejector Steam Jet Pump, Common Sense Shaking and Dumping Grate Bar, Standard Balance Valve, Reliance Safety Water Columns, Centrifugal Exhaust Pipe Head, Robertson's Waste Oil Filter, Pressure Regulator, Eureka Packing, Wood Belt Clamp, Arc Indicator, Champion Flue Scraper, Injectors, Centrifugal Steam Separator, Garlock's Packings, Hurricane Steam Flue Cleaner, Acme Gauge Glass Cutter, Kellam's Damper Regulator, Sight Feed Lubricator, &c.

I. BRINKERHOFF & SON, Auburn, N. Y.: Invincible Ice Tongs and Ideal Lemon Squeezer. The Ice Tongs are referred to as being made entirely by hand of best quality steel, the points being tempered so as not to become dull with use.

GRAFTON STONE COMPANY, Grafton, Ohio: Grindstone, Saw, Plow, Spring, Nail, Hoe, Hammer and Pulp Stone, Axe, Tool, Hatchet, Hand File, Machine File, Scythe and mounted Grindstone, with Grafton Frame.

WYETH HARDWARE AND MFG. COMPANY, St. Joseph, Mo.: Price current for spring 1891. Steel Goods, Scythes and Snaths, Shovels and Spades, Corn Planters, Post Diggers, Pruners, Lawn Mowers, Wrenches, Barrows, Wagon Hardware, Screen Doors, Windows and Screen Wire, Spring Hinges, Horse Brushes, Curry Combs, Foot Scrapers, Freezers, Balances, Hammocks, &c.

Perkins' XL Steel Horse Shoes.

THE PAMPHLET issued by the Rhode Island Horse Shoe Company, Providence, R. I., for whom J. C. McCarty & Co., 97 Chambers street, New York, are agents, contains a full description of their Perkins Patent Machine-Hammered Horse and Mule Shoes and Improved Toe Calks. The company are now manufacturing an XL Steel Horse Shoe in both front and hind, which are meeting with approval. It is claimed that these Shoes, though much lighter than iron Shoes, hold their shape upon the foot better, are less liable to twist and buckle, and that they have a proportionally longer wear than if made from iron. The material from which they are made is a low grade of steel, selected for its strength and toughness. They are made in Nos. 1, 2, 3 and 4. An interesting table is also given, showing the number of the different kinds of Perkins Shoes in a keg, and attention is called to the comparatively large number of Steel Shoes. As of general interest, we reproduce it below.

Average Number of Perkins Shoes in a Keg.

Nos.....	00	0	1	2	3	4	5	6	7	8
Extra light, front.....	133	100	84	69	54	39	24	9	0	0
Extra light, hind.....	147	117	97	80	65	50	35	20	5	0
Light, front.....	137	114	90	71	51	36	21	6	0	0
Light, hind.....	158	119	102	83	61	43	28	13	0	0
Medium, front.....	87	76	61	53	43	37	32	28	0	0
Medium, hind.....	113	93	79	65	54	47	41	35	0	0
Heavy, front.....	67	53	46	41	36	31	26	21	0	0
Heavy, hind.....	88	70	60	50	43	36	30	24	0	0
XL Steel, front.....	133	107	84	73	61	50	39	28	0	0
XL Steel, hind.....	200	171	149	136	100	84	69	54	0	0
Snow, front.....	172	130	111	93	81	65	50	35	0	0
Snow, hind.....	200	177	143	108	88	74	61	50	0	0
Mule.....	196	182	158	121	101	79	66	56	50	0
Jack.....	246	0	0	0	0	0	0	0	0	0

It is Reported—

That C. H. Martin, Geneseo, Kan., has sold out his Hardware business to L. M. Pratt & McEntarfer Bros.

That G. W. Burditt, Cambridgeport, Mass., dealer in Hardware, has taken E. T. Bynner into partnership with him.

That J. L. Bristow, Covington, Ky., has disposed of his business to Alonzo Graves.

That R. B. Watson & Co., East Liverpool, Ohio, have sold out their Hardware business to Andrew Watson.

That William Williams has opened a Hardware store at Ord, Neb.

That McLeod & Holmes Hardware Company, Omaha, Neb., have been incorporated. The capital stock is fixed at \$75,000. The incorporators are J. N. McCormick, N. R. McLeod, O. C. Holmes and H. O. Deones.

That the contract for furnishing the Hardware for the Sheffield Hotel, Sheffield, Ala., has been awarded to the Manhattan Hardware Company of that place. The contract is regarded as a big one, and was awarded to the lowest bidders.

That Martin V. Williams has purchased Edgar D. Sabin's Hardware, Stove and Tin store at Wallingford, Vt.

That the Hardware store of F. W. Brosig, Navasota, Texas, was burglarized on the 10th inst., and a considerable quantity of Pistols, Knives and Cartridges stolen.

That Thomas S. Ridge Hardware Company, Kansas City, Mo., have been incorporated. Capital \$30,000.

That the interest of the late M. D. Moore in the Hardware firm of Moore & Jansen, at Fonda, N. Y., has been purchased by Ferguson Jansen. He will conduct the business alone hereafter. Mr. Jansen will make a large increase in his stock. He has had years of experience in the Hardware business.

That Leon H. Ballou, who has been the bookkeeper in the Hardware store of A. D. Pomeroy, at Lockport, N. Y., will take the agency for Crane Brothers of Chicago. Miss Norman will succeed him in the Hardware store.

That C. J. Lawson, Hardware dealer, of Newburg, N. Y., is having an elevator built in his Water street store for convenience in handling goods. It will run from the basement to the roof.

That in the new business block which John Stewart is about to erect at Glens Falls, N. Y., Stone & Davis, Hardware dealers, will open a store.

That Crane & Parker, Hardware dealers at Binghamton, N. Y., have largely increased their Stove and general stock. They are making a specialty of their Steel Ranges and are having large sales of the same.

That one of the liveliest Hardware firms is that of Payne & Henderson at East Lockport, N. Y., who are doing a large business. They report a splendid outlook for spring trade and are continually increasing their stock.

That A. V. Gard's Hardware store, at Watseka, Ill., was recently destroyed by fire. Loss, \$35,000; insurance, \$15,000.

That M. P. Kirkpatrick & Co. have purchased the stock of Hardware, Stoves, Guns, &c., of Miller Bros. & Kirkpatrick, Piercetown, Ind., and will continue the business.

That Van Sickle & Aldrich have bought out Branch & Sessions, Hardware dealers, Maple Rapids, Mich.

That Joseph Watt, Mingo, Iowa, has sold a half interest in his business to J. W. Hutson, and the firm will hereafter be known under the style of Watt & Hutson.

That A. Pierce & Co., Lake City, Minn., have sold out their business to W. J. Richardson & Co. of the same place.

That A. A. Aldrich will open a new Hardware store at Dalton, Mich.

That A. B. Park & Son have succeeded A. B. Park, Hardware, Kendallville, Ind., Frank B. Park having been admitted to partnership.

That Smith & Lynch, Littleton, N. H., have purchased the stock of Hardware belonging to the C. W. Brackett estate.

That R. L. and J. F. Hollingsworth have purchased the stock of Hardware and Implements of J. T. Burt, Temple, Texas, and will continue the business.

That Charles W. Scharff's Hardware store at Canajoharie, N. Y., was destroyed by fire on the 19th inst. Loss, \$5,000; insurance, \$2,600.

That J. B. Sperry & Co. have succeeded Geo. N. Schillinger, Standish, Mich., dealer in Hardware, Stoves, Paints, &c.

That at Colorado, Texas, the Beyer Hardware Company have been incorporated, with a capital stock of \$25,000.

That Westfall & Son have purchased the Hardware, Stove and Tinware business of S. M. Reaugh, Burnside, Ill.

That the firm of Peterson Bros. & Johnson of Willmar, Minn., will dissolve. Samuel Garvar will probably succeed.

That H. F. Boshford, formerly of Logan, Kan., has purchased the stock of Hardware, Stoves, Implements, &c., of Walker & Christie, Vermillion, Kan., and will continue the business at that point.

That the Hardware store of A. J. Taft, Mazeppa, Minn., has been burned out.

That W. F. Farnham, Oneida, N. Y., is about to open a Hardware store in that place.

That Brown & Whisonant have recently opened a large Hardware store at Blacksburg, S. C.

That Morgan's Hardware store at Vincent, Iowa, has been sold to Granger & Son.

That D. H. Jerome & Co., Hardware dealers, Saginaw, Mich., are about to remove to Marquette and form a corporation with a firm doing business at that point.

That Baker & Foster is the title of a Hardware Store recently opened at Beverly, Mass.

That Adolph Glaser has bought the Hardware stock of the late Edward Wehmeier, New Brunswick, Mo.

That W. H. Crooker, Unadilla, N. Y., has sold his Hardware store to Charles H. Stebbins.

That the W. C. Plass Hardware Company have been incorporated at St. Louis, Mo., with a capital of \$40,000. John Krauss, J. B. Quigley and W. T. Stewart are mentioned as incorporators.

That Comer & Clayton, Hardware, Taylor's Falls, Minn., have dissolved partnership, the latter succeeding.

That the firm of J. L. Douglas & Co. have been incorporated at Peoria, Ill., with a capital stock of \$15,000, for wholesaling and retailing Hardware, Tinware, Stoves and Cutlery. The incorporators are J. L. Douglas, S. L. Douglas and L. W. Lindsay.

That C. E. Jennison & Son have succeeded to the Hardware business formerly conducted by Jennison & Co., Bay City, Mich.

That Sibley, Lindsay & Curr of Rochester, have established a new Cutlery department in their store.

That R. R. Neyland & Co., Greenville, Texas, dealers in Hardware and Agricultural Implements, have sold out to C. B. Jones and G. H. Collins.

That Weis & Ridge Hardware Company is the name of a new firm recently incorporated at Kansas City, Mo. The capital is stated to be \$25,000.

That Tenk Hardware Company have been incorporated at Quincy, Ill., the capital stock being \$60,000. The firm will conduct a wholesale and retail Hardware business. The incorporators are Henry Tenk, John H. Tenk and August C. S. Strook.

That Newman & Kennedy have succeeded the firm of Orvis, Newman & Kennedy, Portland, Mich., Mr. Orvis having retired from the Hardware business after 18 years' successful connection with it. The members of the new firm have been associated with Mr. Orvis for the past eight years.

That the Roberts, Willis & Taylor Company have succeeded the Roberts, Hardwicke & Taylor Company, Sherman, Texas, T. F. Willis, late of the Hall & Willis Hardware Company, Kansas City, Mo., having purchased an interest in the business. The same line of goods will be carried as in the past, including Hardware, Tinware, Stoves, Implements, &c., and no change is contemplated in the policy of the company.

That W. P. Tucker, L. I. Harding and T. M. Harding have formed the Tucker-Harding Hardware Company, and will conduct business at Canon City, Col.

That the McLeod-Holmes Hardware Company, Omaha, Neb., have been incorporated, with a capital of \$75,000.

That Gustave Rechlin and George Frank will open a Hardware store in the Union Block, Bay City, Mich., in March.

A. M. Holter Hardware Store.

WE ARE indebted to the A. M. Holter Hardware Co., Helena, Mont., for the illustration accompanying the following description of their store and business. The cut shows the first floor of their establishment. The company occupy at present the first and second floors and basement of the Holter Block. These floors are well filled with a general line of hardware, also large lines of railway and mining supplies of all kinds, of which they make a specialty. The store is supplied with a number of improvements and devices for convenience in handling goods and waiting upon customers. Jobbing is a prominent feature in the company's business, and

in getting goods when ordering mining or other machinery. The opening up and rapid development of the Castle district during 1890 has caused a large demand for mining machinery. The company have sold hoisting plants and pumping machinery to a large number of companies in that district during the past season.

Suggestions for the Retail Trade

A CORRESPONDENT writing over the name of C. L. Searcy contributes an article to a recent issue of the *American Storekeeper* which contains much that is of interest and value to readers engaged in the retail trade. In discussing the general subject of the retail business he says:

Shoddy goods in any line will injure a merchant's reputation, and a merchant should always try to carry good goods, and his trade will soon appreciate them. After a merchant has decided on his local-

with the entire trade, individually and collectively. When a merchant is situated conveniently he should always run a department store. It keeps a man busy, and that is the life of trade. Keep everything that families want and your good trade demands. You must keep thoroughly posted on prices of every line of goods and know a bargain when you have a chance to buy one. Stick to first-class wholesale houses. If you pay them promptly and always come up in every particular they will give you all the bottom prices of the market. Do not leave a good first-class house without cause, to run off after a bait in some job lot concern.

After you get your goods home carefully examine each bill and add up and see that each item is extended correctly; mark and check off, and if any error occurs report it at once. Count up the expenses, freight, &c., and add the per cent. to the cost of the goods; it is as much cost

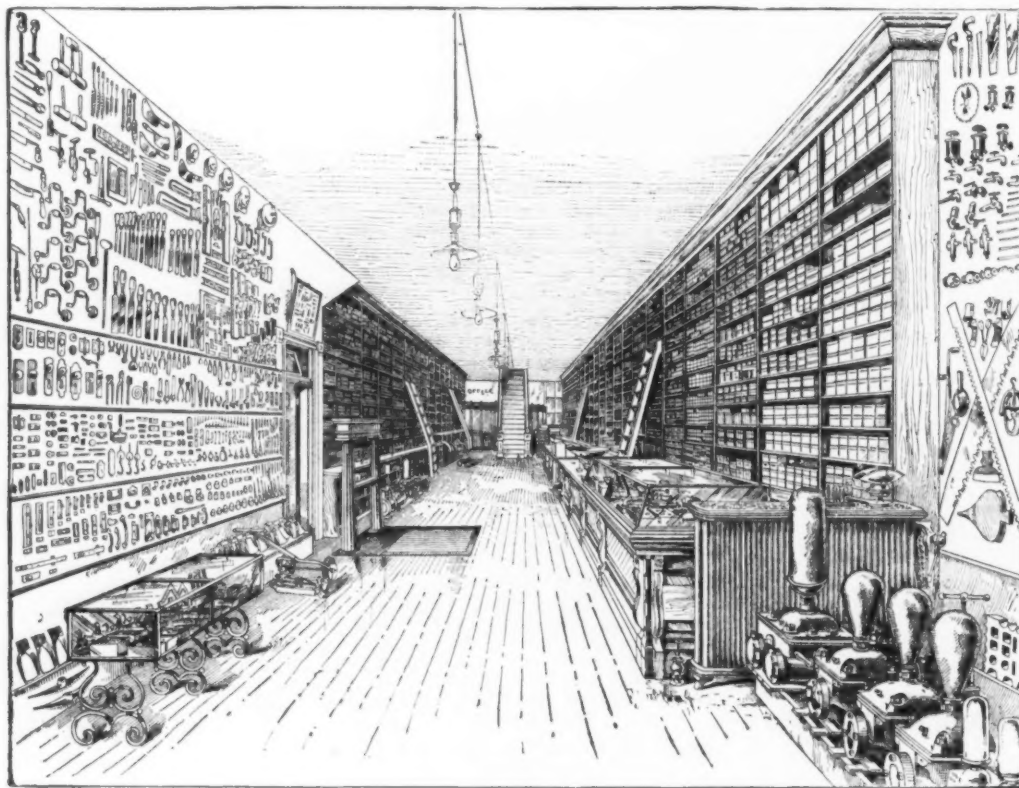


Fig. 646.—A. M. Holter Hardware Co.'s Store, Helena, Mont.

large sample boards are seen on either hand upon entering the store. The remainder of the first floor is devoted to shelving, which reaches to the ceiling, counters and show cases, with a stairway in the rear to the second story, back of which are the offices. A large platform scale set in the floor stands somewhat back from the front doors. Traveling ladders make the goods on the higher shelves accessible. The firm, owing to the growth of their business, are in need of more room, and we understand in the near future will remove to buildings especially suited to their needs. Last year they erected on the Northern Pacific right-of-way a stone warehouse, the dimensions of which are 88 x 80 feet, and is one story high with a basement. It is well filled with different kinds of mining machinery, including engines and boilers of capacities ranging from 2 to 60 horse-power, hoisting engines, air compressors, &c. The company carry the stock and have shipping facilities for filling orders promptly, thus obviating the usual unpleasant delay

ity, the first important step is to lay in goods. If goods are well bought at the lowest prices, you are then even with other merchants; but you must endeavor to lead other merchants and keep leaders that will insure you a profit and at the same time name you as the leading merchant. This requires sound judgment and a thorough knowledge of your means and of your intended customers. There are a great many staple goods that are in demand in every locality, yet nearly every community has its special wants, which knowledge is soon acquired by paying close attention and always being alive to the wants of your trade. If you can pay cash for your goods it is by far the best plan; but in farming communities and when merchants give credit they cannot all do this. You must be very cautious and not contract any bills that you cannot collect from your trade. A good credit is of incalculable benefit to every merchant, and he must strive to keep it good by paying promptly all bills left unpaid the very day due. Never under any circumstances procrastinate; it is dangerous.

Promptness should be the leading characteristic of every successful merchant, not only with the wholesale merchant, but

as the goods, and if not tacked on here will go to the loss account. You must be supplied with gum, hook and string tags, and carefully mark every article cost and selling price, both in your private mark. Don't neglect to mark all little things and all goods at this time, as it will cause confusion if omitted. Most articles are easily marked, others require considerable ingenuity in getting marked intelligibly. If the manufacturers of jeans and cassimeres would let the corner of the first end of jeans protrude far enough and place a metal eyelet, and then print their brand and the number of yards on a strong shipping tag with blank on the reverse side to keep the number of yards sold, instead of the brittle cards they now use, which are generally lost the first week, they would be entitled to a chromo and a large jeans trade. It would be more convenient when a merchant takes stock and at all other times.

After your goods are all marked and bills properly entered up, then comes the tug of war keeping stock in order and selling goods for a profit. Properly to keep stock in order requires you to be hustling around continually. Cleanliness is the first consideration. Keep your store

and goods scrupulously clean, sweep out, dust and brush out often. Have a clean, well-ventilated and inviting place for ladies. When an habitual loafer comes in be busy dusting out; when a lot of political bummers come in for argument be busy sweeping out, &c. Keep your windows, show cases and all metals bright and clean, use curtains to hang up the entire length of your shelves, to protect goods from dust. Use netting over all metals, glass, and queensware to protect from flies; take special pains to open all your boxes without splitting the tops; never leave boots and shoes loose or in shelves exposed to dust; keep all groceries and everything that is sold to eat closely covered up; keep your scales and measures and all appliances in good trim; in fact, be nice and tidy yourself and have everything about the store to correspond. Supply yourself with all the new appliances and fixtures that will save time, money and labor; it will be money well spent.

Have a bargain counter and close out all remnants and shop worn goods at a price. Do not let them accumulate. Protect all goods from sun or dust that will damage. Now try to arrange goods to make a good display; rearrange often, and see how many goods you can show off to advantage. Your taste will improve, and by study and practice you will soon be an expert. Have display cards calling attention to the various articles, and these properly arranged add greatly to the looks of the stock. Now, to sell goods requires that you should be a respectable citizen, worthy of the confidence of the good people of your vicinity, not given to sharp practice or sham respectability, but possessing the genuine article.

If you are worthy of the confidence of your neighbors go to work with a vim and try to get every good new customer possible by being polite and attentive. Be the first man to open your store in the morning and the last man to close; take as much pains to wait on a child as on a grown person; never misrepresent goods, but do a straightforward, square business, and you will gain custom. Keep your own secrets; if you are making \$5000 per annum do not tell any one, as human nature is weak and jealous. If you are losing money and cannot stop the leak don't tell it, but close out to some man that thinks he can make money, and try a new location. Don't try to be a successful merchant and at the same time run the political machinery in your "district;" it will be too great a strain on your nerves.

It falls to the lot of only a few merchants to be able to run a strictly cash store, but they have to sell on credit in farming communities, &c. Don't imagine that when you are selling a great many goods on credit at a good profit you are getting rich. You will soon run against a solid rock wall, and will have to take to the woods. Scrutinize closely all the surroundings of your customers who desire credit. Have a specified limit agreed to and thoroughly understood by customers with a limited credit, and do not fail to stop when the limit is reached. When a customer is not entitled to credit, say "No," politely, but positively. Be firm in all your transactions. There can be considerable ingenuity and tact about refusing a man credit and still retain him for a cash customer. As a general thing, avoid giving credit to squatters or transient customers, as they generally fold their tents and quietly slip away to try their credit on another confiding merchant.

In giving credit always remember that you are the party that is extending the accommodation, and not the customer. When you have your goods credited out you are at the mercy of your trade, and have to depend on their prosperity for your success. If you owe a lot of minor accounts in your neighborhood it is your

duty to settle up by cash or note. Don't permit them to accumulate. Short settlements make good friends. In collecting debts remember the old Quaker advice that there is more virtue in a gill of oil than a barrel of vinegar; therefore do not abuse a man when he owes you, or crowd him when he is down, but trade your bad debts to him for anything that has a market value, and you will realize more than in a legal process, and still have him for a cash customer. Never leave a debt open on your books; no matter how small, close it up by note, and then there will be no misunderstanding.

Don't forget that the credit business is dangerous and requires much watching and prayer to avoid the deadfall. In every community there are customers who regard all merchants with doubt; a good idea is to present each with a pass book and require them to bring it and record each transaction, and they will soon get over it. Have every transaction thoroughly understood before customers leave. Keep a pass book in your pocket to enter each sale when made, and invariably at night copy same in day book. Keep your ledger posted up; never get way behind; it is a mark of laziness and shows that you do not keep in advance of your business. After you have been in business 40 years you can still learn something new. To sum up, a merchant's life is one of toil and trouble; all that embark in this business must begin with a determination to keep a firm and steadfast grip on their business. At times it will seem dark and gloomy, but will eventually land you on the top round. Frequently an embryo bankrupt, with a little money or brains, will open a rival store and tear up the gravel generally for a few days by selling good at ruinous prices and take every underhand advantage of your trade, but by and by all will be still except the red flag fluttering to the breeze about his store. As a general thing, merchants are always the first approached for all enterprises that help build up the country, and it is a constant thing for them to feed and clothe the widow and orphan, the humble and downtrodden all over the land, and for these many unpublished charities let us hope they are recorded on the Cr. side of that Great Ledger in that country where no shoddy goods go.

Little Things in Office Work.

BY PARK ROW.

ONCE AN ENGINEER went to a firm of bridge builders which had taken a contract to put up an immense iron bridge, and said that he had discovered an error in the "strain sheet" (or series of diagrams from which are computed the sizes of beams and other members to carry the required maximum load with the necessary factor of safety) which would make a difference of 2 per cent. in the bridge cost. The contractors simply pooch-pooched the matter—they "weren't going to overhaul all their bills of material for 2 per cent."

"I don't think," said the engineer, "that you have reflected that 2 per cent. of \$1,500,000 is \$30,000." That incontrovertible mathematical fact had not really struck him. They paid him to overhaul the strain sheets and the "bills of materials."

So all the way through in office work, the 2 per cent. here and 3 per cent. there, and little percentages all around, count up to large sums in the course of a month, a year, a decade. Even the half per cents. and quarter per cents., and even the wastes on comparatively small amounts, deserve looking after as establishing the principle of looking after the small percentages.

Not that the traditional old retail skinflints are right in making a clerk (so-called

by custom; *lucus a non lucendo*) take 10 cents' worth, or even 2 cents' worth of time to cut a knot when the job could have been done by sacrificing $1\frac{1}{2}$ inches of the cord, at a gross loss of $\frac{1}{5}$ cent, but that is saving at the spigot in a microscopian way to waste at the bung-hole, also microscopically. But it is right to look out for and remedy petty wastes which do not involve net losses to do away with them. The knot untying business only teaches employees to save \$1000 at the cost of \$10,000.

As I write with difficulty on this rough surface paper and with this ink thickened by the summer's heat there occurs to me one source of waste in offices, the use of rough stationery, which not only wears out the pens soon, but actually wastes time by the greater resistance which they offer to free handwriting. If a clerk's or a partner's capacity for copying, or entering or corresponding be lessened only 5 per cent. by rough paper, sharp pens and thick ink, that means from 5 cents to \$1 a day, and there are letter papers which will lower one's capacity from 20 words a minute to 15.

A little money "saved" by buying a safe which will barely hold the books and papers, or by getting a poor one, may prove a bad saving after a fire in which the book edges, which had been lying right against the door and back of the safe, get charred through about an inch, thus obliterating all the dates and about half the columns of figures.

In this connection, by the way, it might be well to mention that some quite large establishments purposely keep their books on poor, heavily clayed paper, claiming that the fancy linen ledger papers, on which one may write and scratch six successive times in one spot, offer too good opportunities for "fixing" or "cooking" the accounts, and do not stand fire so well as the "poor" kinds.

How much are dry goods deteriorated by dust, through neglect to have the streets watered within a short radius of valuable stock?

How much does it cost in labor, or in marking down, to omit to keep a little lime in the show case or bulk window of a Hardware store; or to neglect to ventilate the latter, particularly if gas is burned in them?

How much time is wasted, having the salesman, the van clerk scattered all over the establishment, so as to necessitate constant visits?

How much time is wasted writing "Replying to your valued favor of the 19th inst.," and "Referring to our letter of the 17th inst.?" This might be saved by having engraved or printed on the letter-head these two lines:

Replying to yours of.....

Referring to ours of.....

I am not sure that I shall not include the preparation and sending of a regular letter when a postal card would answer as a source of waste. The postal card saves the entire cost of letterhead and envelope, and about $\frac{3}{8}$ cent's worth of letter copy book; but more than this, it saves time of corresponding clerk and office boy, and helps to avoid cluttering desks up with correspondence. It also saves the recipient's time and file space. The difference between 30 enveloped letters and 30 postal cards would make a great and desirable hole in the work in any office, either sending or receiving that number a day of acknowledgments of receipts of orders, letters, &c.

There are many, many more little things which by saving pennies would aid in piling up dollars, and by saving time would practically lengthen life.—*The Office.*

Barb-Wire Patents.

The consummation of the negotiations with reference to the acquirement of the Barb-Wire patents by the Columbia Patent Company is not yet announced, but it is intimated that these negotiations are progressing satisfactorily, and that there is little doubt of their successful termination in a way that will be in accordance with the interests of all concerned. The trade, however, will bear in mind that these negotiations do not look to the forming of a trust or the control of prices or production. A number of misleading statements on this point have appeared in the daily press in different parts of the country. If the matter of patents is satisfactorily adjusted, it is, of course, not unlikely that the manufacturers will see their way clear to taking further united action for a furtherance of their interests, and the giving of regularity to a market which for a long time has been exceedingly uneven, with prices in many cases unprofitably low. The present negotiations, however, concern simply the ownership of the patents, and the formal consummation of the matter has not yet been accomplished.

It Is Reported—

That the firm of Thornton & Herrick, retail Hardware, 2775 Wilson avenue, Cleveland, Ohio, has dissolved, F. C. Thornton continuing in the business.

That J. B. Moore, of the firm of Brush, Moore & Co., retail Hardware, Cleveland, Ohio, leaves that city to embark in the hotel business in Peoria, Ill.

That Ruhl Bros. & Co. of Findlay, Ohio, contemplate closing out their retail Hardware business, in order to give their whole attention to the saddlery trade.

That A. Paterson & Co., Renovo, Pa., Hardware dealers, will go out of business.

That F. L. Ebey will open a Hardware store at Joplin, Mo.

That Seeley & Strathern are a new Hardware firm at Dunlap, Tenn.

IRWIN AUGER BIT COMPANY, Wilmington, Ohio, are putting up their Irwin Patent Solid-Center Stem Auger Bits in handsome walnut cases, with glass front and velvet-covered back. These cases are intended to stand on the counter. Each case contains one full set of Auger Bits, ranging in size from $\frac{1}{8}$ to $\frac{1}{2}$, and also one each of Carpenters' Augers, Boring-Machine Augers, Car, Machine and Screw Driver Bits. The company make no charge for the case, but send no cases unless they contain Bits. It is the intention in giving away these cases to help the dealer advertise and bring directly before the customer the line of goods manufactured by them. All goods are delivered free of freight or express charges.

THE CLEVELAND HARDWARE JOBBERS ASSOCIATION is just starting out on its fourth year of organization. It is one of the few associations of this kind in the country that has worked harmoniously, and all the jobbers report having derived much benefit from it. It is to be regretted that every large city in the country cannot have such an association, as there is no doubt it would work beneficially to all concerned.

Paints and Oils.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

There are few changes in the surroundings in either the Paint or Oil trades; none, in fact, that would have any pronounced bearing upon values or tend to stimulate buyers to freer action. Crude materials generally stand almost precisely as they were a week ago, and are still free from indications of probable movement at an early date that would tend to either advance or depress prices for manufactured goods. As for movement of the latter, there is practically nothing to note outside of the usual distribution, with here and there some increase of sales incidental to the approach of the spring season. As a whole, the outlook is considered favorable in both branches, and it is noticeable that the few changes in values that have taken place during the past week were chiefly in sellers' favor.

Paints and Colors.

White Lead.—In the absence of any change in the price or in the condition of the market for crude material, or variation in the character of outside competition, the former line of prices for pure Pigment is adhered to by corrodors, and the market preserves a firm tone. Regarding the character of the distribution, there is nothing to note that contrasts with last week's experience. Orders are not coming in as freely as might be desired, yet the movement would appear to be well up to the average volume for the season, and the better class of mixed Leads, as well as the corrodors' products, remain steady at former prices. Jobbers deviate more or less from the "trust" list on sales of pure Lead, but to no greater extent than heretofore.

Red Lead and Litharge.—Some increase is noted in the volume of business in these goods, but the movement is about the usual volume for the season, and prices remain very steady throughout.

Zincs.—American Oxide continues to be moved out in quite liberal quantities in delivery on contracts. There is also a very fair amount of new business, and the position remains very gratifying to sellers. No change in prices has taken place during the week under review. Foreign brands are selling to quite the average extent for the season, and prices remain very steady all along the line.

Colors.—In the staple lines of House-Painters' and Grinders' Colors there has been a very fair business; no movement that contrasts with what is customary at this season of the year, yet some increase in sales, more particularly to the out-of-town trade. Specialties in the line of prepared Paints are also faring somewhat better as far as movement is concerned.

The movement of both English and American Venetian Red shows improvement as the spring season advances, and prices for all grades remain very steady. Orange Mineral is quite firm also. Vermilion has undergone no change, and Carmine remains quiet at former prices. Nothing new has transpired in the Paris Green situation, and the probabilities are that the association prices to be announced April 15 will prevail in all quarters. Orders are coming in fairly. Other Greens are steady at old prices and in fair demand. Good orders have been placed for some lines of Blues, chiefly the better grades, at full prices.

Miscellaneous.—There is no change whatever in the situation of the market for Chalk. Arrivals are still moderate, leaving supplies small here, and future shipments

are held at \$2.65 upward per ton. Whiting has had rather slow movement, but prices for all grades are quite firm. There is now a full supply of foreign China Clay, but prices for both the imported and domestic remain steady. Barytes have found merely routine sale, and the market for other than highest grades is rather easier. French Terra Alba continues scarce, as does also French Talc, but there seems to be a good supply of domestic at old prices.

Oils and Turpentine.

Linseed Oil.—The extremely low price on Western product, referred to last week, was, it is stated, made in one instance only and under peculiar circumstances. The transaction is, therefore, not considered as being any reflection of market value. At the present time 54¢ is the popular quotation, but large buyers could probably do better by about 1¢. City brands are unchanged. Raw Oil made from domestic Seed is still quoted at 56¢ and Calcutta Seed product at 62¢, with usual allowance for package. The sale of city brands is fully up to the average for the season, but the movement of outside brands is slow here, although reported good at other points.

Cotton Seed Oils.—There has been a rather freer movement of refined Oil, chiefly low grade, on export account. A block of about 2500 barrels Summer Yellow was taken for direct shipment from the South and there were rumors of additional transactions. On the spot, upward of 1000 barrels "off grade" have changed hands, at prices within the range of 28½¢ @ 29½¢. Prime quality is valued at 34¢ @ 35¢ and offers of 33¢ were refused. In the crude product there has been little doing, but negotiations reflect a firm feeling on the part of holders, and a turn for the better in values at an early date is anticipated, as supplies are remarkably well under control.

Lard Oil.—No further change in prices has taken place. Present quotations are on a level with the lowest cost of raw material and competition is more temperate. The movement of supplies from first hands has increased somewhat and there is a very good demand at the present time. Hence a better feeling, with expectation in some quarters of prices advancing should raw material go higher.

Fish Oils.—The largest sale recorded of crude Sperm Oil was made at 71¢ in New Bedford, and shows a very firm market. There is no change in the Whale Oil situation, and no business has yet transpired at the prices fixed sometime ago for crude Menhaden. There is a steady distribution of the manufactured products, with prices firm all along the line. Cod Oil is still held at an unusually high price, owing to small supply on the spot.

Cocoonut Oil.—Cochin product has been sold at 8½¢ on the spot, but holders assert that the price was exceptionally low, and are generally quoting 9¢. Buyers at the latter figure are few and far between. Ceylon has been selling at 6½¢ @ 7¢, as to style of package and quantity, but the movement at present is slow.

Olive Oil.—Higher prices, due to the decision of the Treasury officials that Oil in barrels is used for other than mechanical purposes, are maintained, and the spot supply is concentrated. There is merely the routine movement at present, however, and no particular life to the demand from consumers.

Spirits Turpentine.—In the absence of any radical change in the Southern market, prices are varied here to a limited extent only. The demand at present is rather slow and almost wholly on home trade account. Latest transactions were at 40½¢ for machine barrels.

Jack Frost Freezer.

American Automatic Vending Machine Mfg. Company, 43 Park street, New York, are introducing a cream freezer, as illustrated, Fig. 1, unlike the ordinary style of



Fig. 1.—Jack Frost Freezer.

freezer; the ice and salt are placed inside the cylinder, Fig. 2. The cylinder is made of heavy tin with galvanized heads. There is an opening in the head opposite to the one to which the handle is attached for filling, made air-tight by the use of a plug. The size of this hole limits the size of the pieces of ice used, the smaller pieces quickening the freezing process.



Fig. 2.—The Cream Pan.

The cream is placed in a pan, Fig. 2, below the cylinder and raised by knobs at the outside of the box high enough to allow the cylinder to dip into the mixture. When it is desired to freeze the cream solid on the cylinder the crank is turned slowly until the contents of the pan is



Fig. 3.—Cylinder and Crank.

frozen. If the cream is to be served or repacked in bricks or molds the pusher, Fig. 4, is placed on the tin box in front, Fig. 5, which presses a cutting edge against the cylinder. Then, by turning the crank slowly the frozen cream is shaved off as fast as frozen and drops into the pan. The manufacturers state that it



Fig. 4.—The Pusher.

is impossible for the ice or salt to leak or come in contact with the cream, and that being frozen in thin layers the cream is as smooth as if it was beaten. These freezers are made in four sizes, to freeze from 1 pint to 8 quarts of cream. The capacity of each size as given designates the amount of frozen cream that the cylinder will collect and hold at one freezing. The manufacturers claim that by the use of this

freezer there is a saving of 100 per cent. in time, ice and labor; that a temperature of 4° below zero is obtained, freezing cream very rapidly, and that the cream

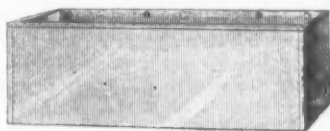


Fig. 5.—The Front Pan.

keeps frozen longer than in the ordinary freezer.

Plain and Ratchet Braces.

Mason & Parker, Winchendon, Mass., G. T. Moore general agent, 112 Chambers street, New York, are introducing a plain and ratchet brace, as shown in Figs. 1 and 2. The manufacturers call attention to the fact that there is not a particle of strain on the jaws, as there is a square hole cast in each socket to receive the shank of the bit, and the jaws are seated on an oil-tempered spring in such a way that when the sleeve is screwed down they adjust themselves to both the spindle and shank of the bit, avoiding a slip endwise, and designed to center each bit exactly. The claim is made that the spring is so

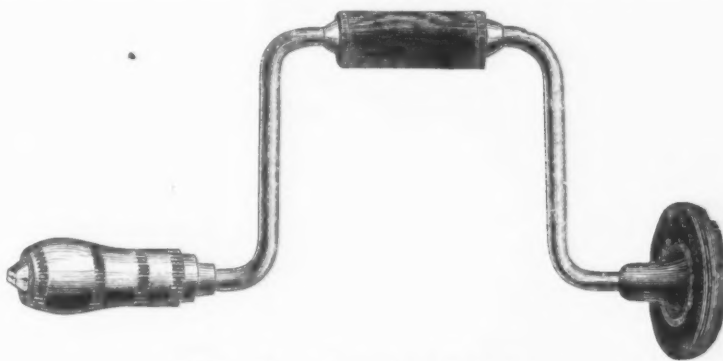


Fig. 1.—Mason & Parker's Plain Brace.

fine in temper that it may be closed for months, and when relieved it will open to its original length. The ratchet is referred to as being in the most convenient place on the brace, and as being light and not cumbersome. The ratchets are all made of steel, and all parts liable to wear are hardened. The point is made that each part is made interchangeable, in the most workmanlike manner, and that from its

scales, for which they accept but one order from a single jobber.

I. A. Weston & Co., Jamesville, N. Y., are manufacturing improved suspension steel wheels, adapted for all purposes. They also make a specialty of making cushion and solid tire bicycle wheels for manufacturers of safety bicycles. These

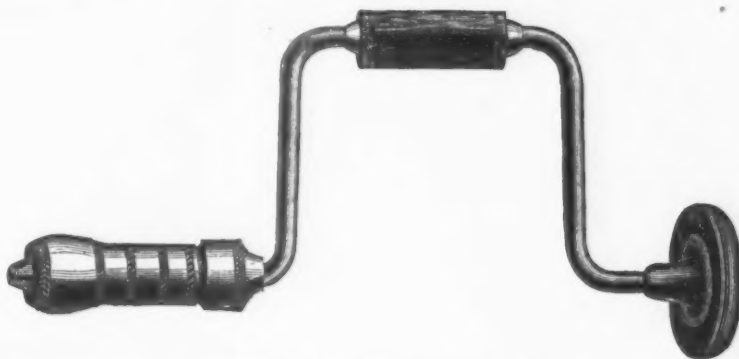


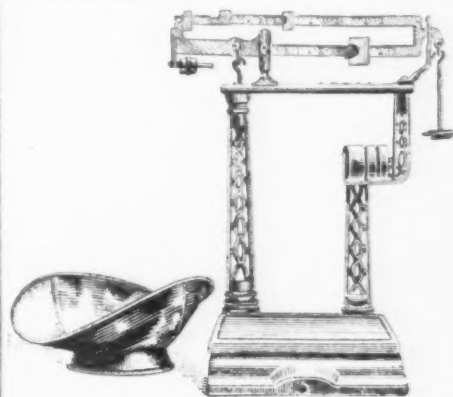
Fig. 2.—Mason & Parker's Ratchet Brace.

peculiar construction it can never slip or get out of order. These braces are made from 6 to 14 inch sweep, polished and nicked, with cherry, cocobola or rosewood handles and lignum vitæ, cocobola or rosewood heads. The braces are all packed in anti-rust paper, half a dozen in a pasteboard box.

are made with cams or parallel bearings, direct spokes riveted to the crescent ring, or spokes threaded and attached to the rim with long sleeve nipples, pure para rubber tires and black enamel or enamel and nickel finish. Attention is directed to their advertisement on page 92 in *The Iron Age* of February 12, 1891.

Royal Grocer Scale.

Jones of Binghamton, Binghamton, N. Y., is introducing a scale for grocers' use, as illustrated herewith. This scale, the manufacturer claims, has the advan-



Royal Grocer Scale.

tage of being light and pleasing in appearance without sacrificing anything in its size or capacity. Rapidity in operation, accuracy in weight and durability of construction are some of its points of excellency. This scale is included with the others in their sample case of sample

The Olney Vehicle Spring Support.

The Olney Vehicle Spring Support Company of Olney, Ill., are putting on the market a coil spring for use in relieving elliptical springs of the strain on them and for supporting weak or broken springs, as illustrated herewith. With this spring support a single leaf spring can be used for much heavier work than it alone would be capable of carrying. The spring support also diminishes jolting in riding over corduroy or other rough roads, by easing the pressure on the elliptical spring, and prevents the spring from breaking when it is suddenly compressed by striking a rock or log. The collars of the support are made of the best malleable iron, and the coil spring is made of oil-tempered steel. The spring support can be used with the single leaf elliptical on new wagons, or it can be applied to old springs, and

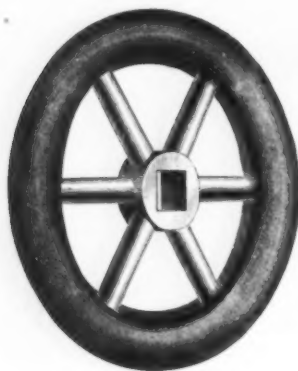


The Olney Vehicle Spring Support.

will then serve the purpose of a new spring at a much less cost. These springs can be used for spring seats on road wagons, for buggies, carriages, spring or road wagons and other vehicles. The springs are more elastic and serve the purpose better than rubber bumpers, and they are made to support any pressure up to 4000 pounds without breaking or losing their elasticity. The ends of the spring are so formed that they tightly clutch the collar and cannot loosen. Practical tests have been made which prove the value of the support, while many testimonials of its worth have been received from those to whom they have been sold. The simplicity of construction and durability in use make it especially valuable, while the cost is less than that of an elliptical spring of the same capacity. A double coil spring without the elliptical is also made to be applied to farm and jolt wagons.

Rubber Cover for Valve Wheels.

Jenkins Brothers, 71 John street, New York, are offering the trade an article that will be of much interest to steam-fitters generally. The illustration shows a valve wheel with a rubber cover, the



Rubber Cover for Valve Wheels.

object of which is to prevent burning the hand. These covers are adapted to valve wheels, water combinations and gauge cocks. The rubber being a non-conductor of heat, when on any hot valve wheel enables it to be handled without discomfort. The cover is put on by

simply stretching it over the wheel, and in a few days, on a hot wheel, it will adhere strongly to the metal. If the old valve wears out and becomes useless the rubber cover can be removed and applied to a new valve. The rubber, it is said, is a special composition and will not burn

is claimed that the application of roller bearings to the journals of the rolls allows the wringer to be operated with one-fourth of the labor which would be required to turn the rolls without this improvement. The construction and material of these wringers are referred to as all

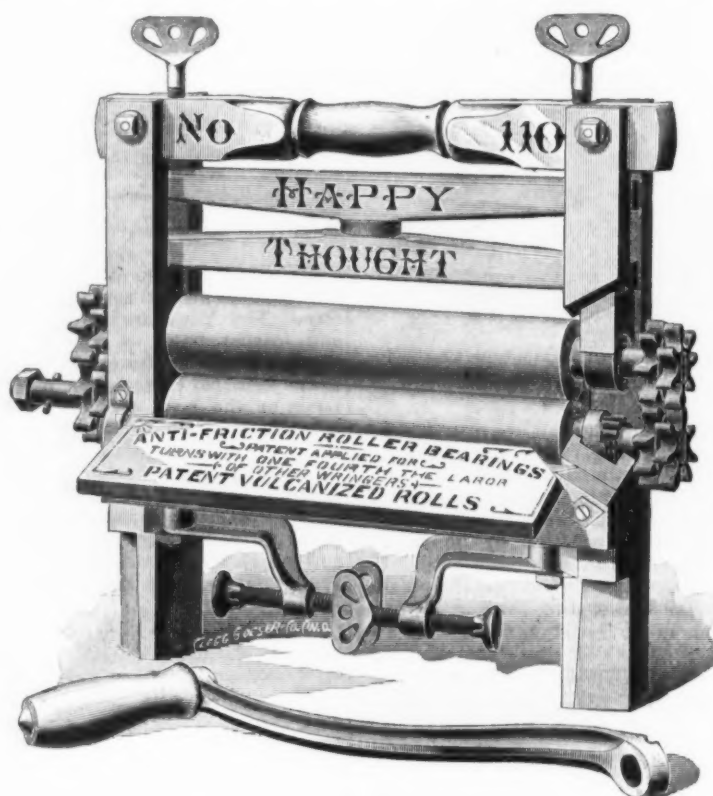


Fig. 1.—The Happy Thought with Anti-Friction Bearings.

on any hot wheel. Another advantage is that the hands will not slip, so the covers are especially recommended for use in dye houses, laundries, &c., where the hands are always wet or damp. The covers are made in six sizes, adapted to wheels from 2 to 4½ inches in diameter.

Wringers with Roller Bearings.

Lovell Mfg. Company, Erie, Pa., are putting on the market clothes wringers with anti-friction roller bearings. These

that can be desired, and the improvements embodied in them are regarded as of especial importance.

Aurora, Ill., has gained another important business enterprise, which is this time at the expense of Iowa. The Western Wheel Scraper Works, whose plant at Mount Pleasant, Iowa, was one of the largest of the kind in the West, removed their machinery to Aurora last week, and will occupy extensive buildings which have just been completed for that purpose.

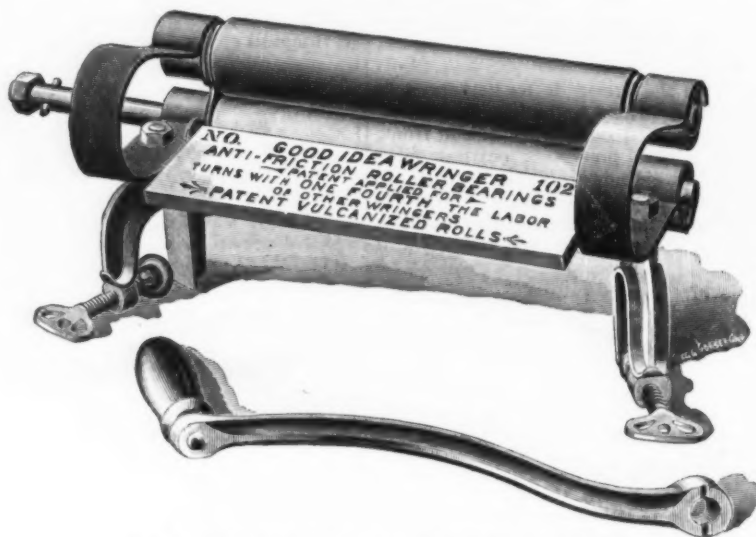


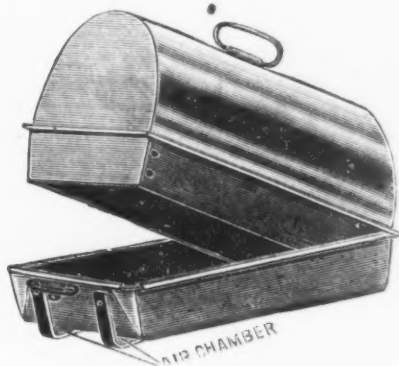
Fig. 2.—The Good Idea, with Anti-Friction Bearings.

are applied to both wood-frame and iron-frame wringers, as illustrated herewith. In Fig. 1 it will be seen that the frame is cut away, showing the roller bearings. It

The cause of the removal is the desire of the owners of the works to secure better railroad facilities than they had at their old location.

The Boss Roaster and Baker.

J. T. Terry, 1053 Main street, Buffalo, N. Y., is introducing a roaster and baker as shown in the accompanying illustration. Among other good qualities of this baker, the manufacturer claims that no odor is allowed to escape into the room, that all trouble of basting is done away with, and that for bread the baker cannot be surpassed. It is stated that while it is only recommended as a roaster and baker, it may be used with good results for boiling corned beef, hams, fish or puddings. Attention is directed to the ease



The Boss Roaster and Baker.

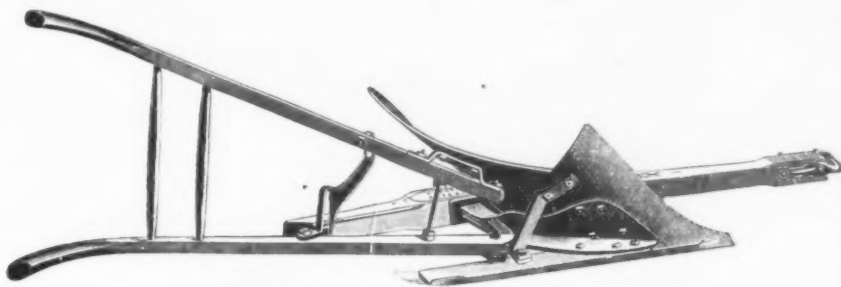
with which the pans can be put together when hot, without danger of burning the hands. The point also is made that it is durable and simple in construction.

Deere's Patent Steel-Frame Steel Plow.

Deere & Co., Moline, Ill., are introducing a steel-frame steel plow, as illustrated herewith. This shows the plow bottom, which consists of but four parts. The share and moldboard conform in shape to their other styles of plows. The frame is one piece of solid forged steel, shaped under a drop press to form the standard and frog, to which the moldboard, share and landside are bolted. The landside is solid steel, with beaded heel, and being bolted direct to the frame, does away with the iron landside with steel plate, and is referred to as being much more durable and more readily fitted. A strong brace from the landside, which also forms the share and mold clip, is designed to make the bottom perfectly rigid, and to add strength to the plow. By reason of there being a less number of bolts and clips in the throat of the plow under the share, it is claimed that the plow is given greater clearance and is less liable to clog with trash. By their method of attaching they can use perfectly straight handles. The point is made that broken handles can be

sary in fitting the share. This construction secures uniformity in all plows of the same size and shape, and the statement is made that duplicate parts can be attached in the field with the ordinary tools found on a farm. Plows of this series are all made with index beam, designed so that

the landing of the plow may be varied by the beam, instead of setting the clevis to one side. On the larger sizes the beam bolt is extended downward through the standard, to which it is riveted, and on to the landside, forming a brace, which completes



Deere's Patent Steel-Frame Steel Plow.

replaced at a hardware store, and fitted by any farmer at home. They depend upon one bolt to hold the share on. On the large sizes extra bolts are used to draw the joints tight, but these are not neces-

the construction. The aim in constructing this plow has been to simplify and strengthen as well as lighten their steel plows, and facilitate and perfect the interchange of parts and the fitting of repairs.

North Star Tool Chest.

G. M. Shirk Mfg. Company, 112 Lake street, Chicago, are manufacturing a tool chest, as illustrated in Fig. 1. The interior of the chest is shown in Fig. 2. This chest is designed for the use of



Fig. 1.—North Star Tool Chest.

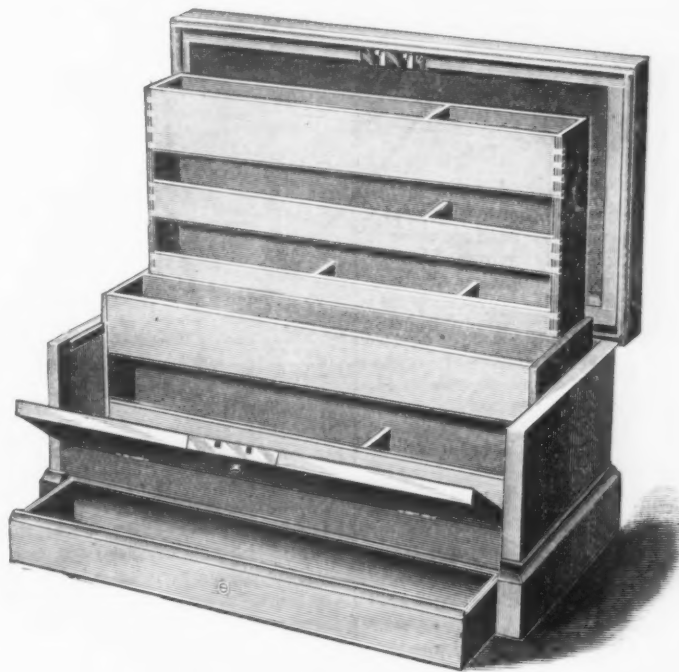


Fig. 2.—Interior of North Star Tool Chest.

machinists, and is 20½ inches long, 10½ inches wide and 10 inches high, is made of quarter-sawed oak, with black walnut molding and trimmings, all hard finished. There are in all 12 separate compartments for tools. The drawer in the lower part is for small tools. The front drops forward on hinges, disclosing a compartment for hammers, and permitting access to small shelves or trays. The back of the chest is occupied by a tray, which extends to the bottom of the chest. This can be lifted out and has seven compartments. The trays and compartments have all been designed with special reference to the tools used by machinists. The chest is fitted with Yale locks, and every care has been taken to make it a substantial, useful and yet a handsome piece of workmanship.

H. H. Bigelow has offered to the city of Worcester, for use as a trade school, the land and buildings heretofore occupied by the Bullard Arms Company. In a letter Mr. Bigelow estimates the value of the plant at a total of \$50,000, including the sum of \$36,500 for the building, machinery, fixtures, &c. Mr. Bigelow will give a deed of the property for \$25,000.

Roe's Pocket Protractor, Square, Triangle, Rule and Scale.

Justus Roe & Sons, 40 Cortlandt street, New York, factory at Patchogue, N. Y., are introducing this combined instrument,



Fig. 1.—Closed.

as illustrated in Figs. 1 to 4 inclusive. These are made in German silver or brass, with a leather case for the pocket. When closed, as in Fig. 1, it is $7\frac{1}{4}$ inches long and 1 inch wide. The various forms that the instrument assumes when in use are

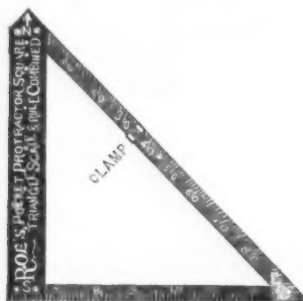


Fig. 2.—Half Open.

shown in Figs. 2, 3 and 4. The manufacturers claim that no other tool except a lead pencil is required to produce upon a sheet of paper, to any required scale, from the field notes alone, an accurate sketch of any field or survey, with any number of courses, angles and distances.



Fig. 3.—Partly Open.

When extended and the clamps secured it forms a protractor of 180° , graduated to every degree, with a radius of not less than 5 and up to 7 inches; 1 straight edge of 14 inches, 2 of 10, and 2 of 7 inches long; 2 right-angle



Fig. 4.—Open.

triangles with sides of 7 inches, and 1 right-angle triangle or square with sides of 10 inches; 4 triangles of 45° each, with sides of 7 and 10 inches each, and every side being graduated with scales in

different divisions of inches, tenths, twentieths, thirtieths and fiftieths. It can be used as a bevel, and any angle of any description or size can be taken with it and readily transferred with accuracy and dispatch. With the aid of any straight edge, by its triangular shape, parallel lines can be drawn accurately and easily, and with the aid of a pin or needle perfect and true circles or parts of circles from 1 to 12 inches in diameter can be drawn with it. It is also stated that in case of emergency, with a little care, almost any angle in a survey can be taken with it while in the field, and right angles and angles of 45° can be taken readily, easily and with a great degree of accuracy. The manufacturers advise us that for over three years they have been trying to make an instrument which would have the merits which they believe this one possesses, adapted for the use of surveyors and engineers.

New Mail Safety.

William Read & Sons, Boston, are introducing for the coming season a bicycle, as illustrated herewith. This wheel is



New Mail Safety.

described as having a diamond frame, low shape handle bars, tangent spokes, one-half nicked and tied, frame brazed on all points, Credenda tubing, all the parts interchangeable, all ball bearings, Garford saddle and cushion tires. While the bicycle is put on the market to supply the demand for a medium-priced machine,

3 and 4 show the Fairy attachment used on the top hame strap. The advantages claimed for these attachments are that the



Fig. 3.—Fairy, Leathered for Use.

slipping of the strap when being buckled is overcome; also providing against the wear, making the durability three times



Fig. 4.—Fairy Attachment for Top Strap.

greater. The trade is supplied with either the straps complete or with the attachments separate.

Hame Straps and Attachments.

The E. Covert Mfg. Company, Farmer Village, N. Y., are introducing hame



Fig. 1.—Dandy, Leathered For Use.

straps and attachments as illustrated in Figs. 1 to 4 inclusive. Figs. 1 and 2



Fig. 2.—Dandy Attachment for Bottom Strap.

represent the Dandy attachment used on the strap at the bottom of the hame; Figs.

The Crystal Filter.

The Crystal Filter Company, Buffalo, N. Y., are putting on the market a filter, as illustrated herewith. Fig. 1 shows the filter with the supply pipe at the bottom, to be attached to the water pipe. Fig. 2 shows the course of the water. Leaving the supply pipe, it is forced through the perforated disks, which are intended to

plated, and the materials used in its construction are referred to as the best that can be obtained.

The Star Drill Company, Rushville, Ind., have produced a five-hoe fertilizer wheat drill having a force feed for the fertilizer. They state that such an implement has long been needed, and that its

is being distributed through the dealers all over the country. An illustrated catalogue for the current year has just been issued by the company, which contains cuts of the several articles of tinware, together with particulars of sizes, &c. These goods include anti rusting pails, sprinkling pots, dish pans, tea kettles, bathtubs, toilet jars, chamber pails, water coolers, wash boilers, wash basins, dip-



Fig. 1.—The Crystal Filter.

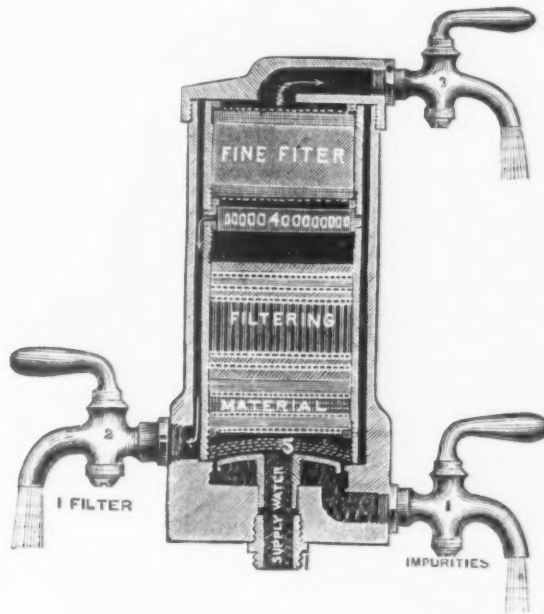


Fig. 2.—Sectional View of Crystal Filter.

arrest the grosser impurities and to have them washed off through faucet No. 2. This faucet is to be left open when drawing filtered water. The water, after passing the disks, continues its course slowly through the filtering material into the chamber at the top, and may be drawn off by faucet No. 1, at a rate, it is stated, of 15 to 20 gallons per hour. It is claimed that

successful production is a matter of congratulation.

New Model High-Wheel Lawn Mower.

Chadborn & Coldwell Mfg. Company, Newburg, N. Y., are introducing a high-grass mower, as shown in the accompanying illustration. This machine is described as having all the good qualities of their New Model lawn mower, together with other new and useful improvements especially adapted to a high-wheel mower. It has a noiseless ratchet which is referred to as durable and efficient. Its driving wheels are 10 inches in diameter, and the revolving cutter 6 inches in diameter, being made entirely of malleable iron and steel; the blades are of exceptionally heavy steel. This machine is put upon



New Model High-Wheel Lawn Mower.

the filter is so constructed that the greater part of all the impurities in the supply water are separated and thrown off before it reaches the filter chamber; also that it is self-washing in its operation, thus continually cleansing itself and requiring no skill or attention in its management, as it cannot become clogged or filled up with impurities. The whole filter is nickel-

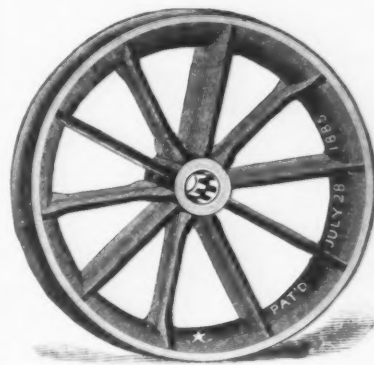
the market fully guaranteed by the manufacturers in every particular.

The Clifton Springs Mfg. Company, Clifton Springs, N. Y., it is reported, are doing a greatly increased business in their product of patent anti-rusting tinware, and also in their patent cake pan, which

pers, besides many other articles in the same line. Accompanying the illustrated catalogue is a price-list of their patent anti-rusting tinware. The company send out a letter to dealers calling attention to this price-list and its increased discount. They also mention that \$100,000 worth of their tinware was sold in 1890, and direct the retailers' attention to the profit that can be obtained in handling these goods.

Self-Lubricating Sheaves for Pulley Blocks.

Boston & Lockport Block Company, Boston, Lockport, N. Y., Henry B. Newhall & Co., 105 Chamber street, N. Y., agents, are putting upon the market self-



Self-Lubricating Sheaves for Pulley Blocks.

lubricating sheaves, as illustrated herewith. As will be seen in the cut, depressions are made in the hub of the sheave to receive a lubricant, and every sheave with this filling is warranted by the manufacturers to endure twice as long as a plain one. Any size of their blocks is supplied with this sheave at a slight increase in cost over plain sheaves.

Miller's Vehicle Wrench.

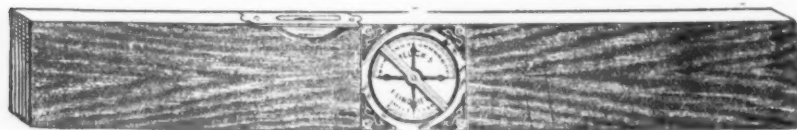
John A. Miller, 303 Lucas avenue, St. Louis, Mo., is introducing a vehicle wrench, as illustrated herewith. The novelty of this wrench consists in the construction of its eye, which, it is stated, makes it adaptable for four different sizes

*Miller's Vehicle Wrench.*

of square nuts mathematically correct, also for two hexagon, two octagon, together with several intermediate sizes fitting more loosely. The advantage claimed is that the trade have to carry 12 different size wrenches to accomplish what three sizes of the Miller wrench does; also that they are no heavier than the ordinary wrenches are. The wrenches are made in three sizes, covering a range of nuts from $\frac{1}{8}$ to $2\frac{1}{8}$ inches.

Clinometer and Spirit Level Combined.

The Melick Clinometer Company, St. Louis, Mo., are introducing a clinometer and spirit level combined, as illustrated herewith. It is a combination of the

*Clinometer and Spirit Level Combined.*

spirit level and pendulum level, the spirit level acting in the usual way, the combination of the two principles in one instrument giving a means of testing by the other. The dial hands are stationary, and the dial moves around, indicating the proper inclination. The dial has two scales—the upper scale, which is divided into the usual degrees of a circle from 0 to 90; the lower scale is for obtaining grades according to the fractions of a foot, 0 to 12 inches incline to the foot. The device is designed for finding levels, inclines, angles and perpendiculars. The manufacturers claim that the whole apparatus

Gwinner's Common-Sense Adjustable Stove Truck.

In the accompanying illustration we present a view of an adjustable stove truck which has recently been placed upon the market by Gwinner, Dowrey

& Co. of Hamilton, Ohio. This truck is designed for use in connection with sample or other stoves, and is made of malleable and wrought iron. By its use dealers can place their stoves on trucks, instead of upon a platform, as is usually the case, and also easily move a stove to any position in the store in order to show it to a customer to better advantage. The manufacturers state that the truck will fit any range, cook stove or heater, and is so constructed that it cannot be pulled apart and will not fall while being adjusted. The four corner pieces or rests for the feet of a stove are connected together with $\frac{1}{2}$ -inch iron rods. One end of each rod is securely fastened to the corner piece or foot rest, while the other end is attached to a sliding boss through

*Gwinner's Common-Sense Adjustable Stove Truck.*

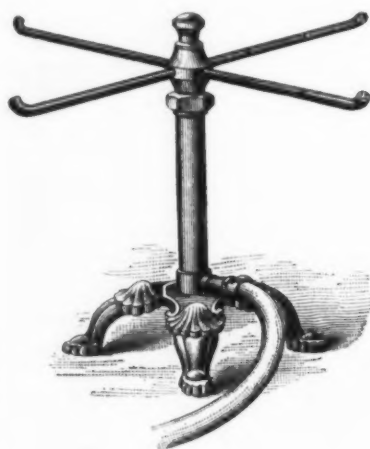
is simple and strong in construction, quickly and easily handled, requires no special skill or instrument for its use, and that it can be laid aside without the application of stops, catches or other parts to keep it from being injured. These articles are made in three sizes—No. 2, 18 inches long; No. 3, 24 inches; and No. 4 30 inches.

ing the truck to be rotated in a very small floor space. The axles of these casters are made of steel, the wheels of gray iron, and the other parts refined malleable iron. The stove truck shown in the illustration is adjustable from 17 x 22 inches to 28 x 38 inches and weighs about 14 pounds. The height from the floor to the foot rest is 3 inches. The manufacturers state that

this truck is meeting with a very large sale, and that over 1500 of them were sold before the patent was allowed.

No. 1 Eclipse Lawn Sprinkler.

John C. Kupferle, St. Louis, Mo., is introducing a lawn sprinkler, as illustrated herewith. It has a cast-iron base, weighing 5 pounds, painted green and bronzed. The stand pipe is $\frac{1}{2}$ -inch, painted red; the arms are brass, the ends of which are so made that it is claimed that the strongest pressure will not blow them out. The

*No. 1. Eclipse Lawn Sprinkler.*

top swivel is made entirely of brass; the arms and swivel being both highly polished. The sprinklers are furnished with brass coupling for $\frac{1}{4}$ -inch hose, and are packed one in a box, which is 12 inches square by 6 inches high. The lawn sprinkler is referred to as being handsome in appearance, and as being sold at a price which enables jobbers to handle it with profit.

The Sensible Coffee Pot.

The Cincinnati Tin and Japan Company, Cincinnati, Ohio, are introducing a coffee pot with an improved strainer, as illustrated herewith. The company claim that with this strainer the coffee does not

*The Sensible Coffee Pot.*

have to be settled or strained, that grounds do not get in the cup in pouring, that it is no trouble to clean, and that it cannot choke up. These pots are made in 2, 3 or 4 quarts of heavy IX tin. They are also making other goods with this strainer.

Cash Register.

A. R. Peck, Cortland, N. Y., is manufacturing a cash register, which is referred to as made by a business man for business men. The register has the appearance of a small desk and has a combination lock. It is claimed that the device educates one to be careful by correcting mistakes; that it is cheap, neat, easy of operation, and durable; that it leaves a record of all money taken in and paid out each day; that it cannot be opened by any one not knowing the combination; that it keeps a record of each man's sales; that it shows every time the drawer is opened; and that the drawer runs on noiseless rollers. The point is made that with the use of this register the cash is always in balance. These are especially intended for retail merchants, and are suitable for saloons and other places of this kind. The present output of these articles, we are advised, is about 200 a month.

Climax Sash Lock and Sash Holder.

Clarence M. Kemp, Baltimore, Md., is putting on the market a sash lock, as shown in the accompanying illustrations.

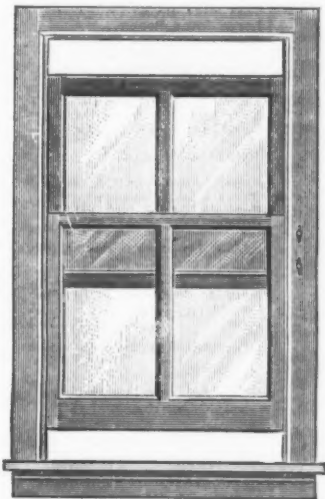


Fig. 1.—Window Open at Top and Bottom but Locked with the Climax Sash Lock.

The device consists of a rod and lock, as shown in Fig. 3. The lock is attached to the casing near the bottom of the upper

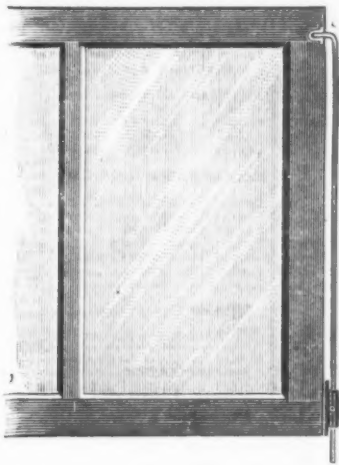


Fig. 2.—Showing the Manner in which the Rod is Attached to Sash.

sash, Fig 2, and at the top of the lower sash. The rod is driven into the opposite end of the sash and passes through the lock. The key is a short rod, threaded to

correspond with threads in the lock, and when screwed home by the key socket presses against the long rod, thus holding the window at the desired point. The keys come out flush with the window cas-



Fig. 3.—Sash Lock for One Sash with Removable Key Socket.

ing, Fig. 1, which is protected by circular castings in which the key socket fits. This device is designed to be placed on new or old windows in houses suitable for box frames or old style frames, for windows of horse cars or railroad coaches, hospitals, &c.

It allows the sash to be raised or lowered to any desired point and the sash locked, so that it cannot be raised or lowered further. It also locks the sash when closed.

A New Hinge.

H. N. Youngman, 1114 Spring Garden street, Philadelphia, Pa., is introducing a patent wire strap and a T hinge, cuts of which appear in his advertisement on page 77 of this issue. A framework of heavy wire, following the lines of the ordinary strap or T hinge, is bound together by rigid cross pieces at regular intervals, and the entire hinge nicely tinned. Holes are made in the cross pieces for the screws, the whole presenting a neat and attractive appearance. Among the advantages claimed for these hinges are that they are as strong and durable as solid iron hinges; that being tinned they are clean to handle; that they can be packed in boxes as shelf hardware, and that they can be sold at a much less price than the ordinary hinges.

PERSONAL.

James P. Witherow, the well-known engineer and contractor, of Pittsburgh, has contributed \$1000 toward the erection of a hospital at New Castle, Pa., where the various shops of Mr. Witherow are located.

Joseph Lydell, until recently employed by the Woodstock Iron Company, of Anniston, Ala., as founder of that company's coke furnaces, has accepted a similar position with the Gadsden Coke Furnace, at Gadsden, Ala.

A number of leading iron manufacturers of the Mahoning and Shenango valleys have taken advantage of the closing down of their works to visit the South. Among

them were L. Raney and George Berger of New Castle, Pa., and J. E. Cartwright of Youngstown, Ohio.

Lieut. Chas. A. Stone, U. S. N., will act as superintendent of the construction of armor plates at the works of Carnegie, Phipps & Co., in Pittsburgh.

Robert Pemberton, superintendent of The National Bolt, Nut and Rivet Works, Reading, Pa., has resigned that position.

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CURRENT HARDWARE PRICES.

FEBRUARY 25, 1891.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobber, at the figures named.

Adjusters, Blind.

Domestic.....\$ dos 33.00, 33 1/2
Excelior.....\$ dos 31.00, 31 1/2
Washburn's Self-Locking.....20@20 1/2

Ammunition.—

Caps, Percussion, 1000—
Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34@35 1/2
E. B. Trimmed Edge, 1-10's.....46@48 1/2
E. B. Grnd. Edge, Cent. Fire, 1-10's.....46@47 1/2
Musket Waterproof, 1-10's.....46 1/2
G. D.....38 1/2
S. B. Genuine Imported.....45 1/2
Eley's E. B.....54@55 1/2
Eley's D Waterproof, Central Fire.....\$1.00

Cartridges—

Rim Fire Cartridges.....50@52 1/2
Rim Fire Military.....15@2 1/2
Cent. Fire, Pistol and Rifle.....25@26 1/2
Cent. Fire, Military and Sporting.....15@2 1/2

Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.
Blank Cartridges, 22 cal., \$1.75.....2 1/2
Blank Cartridges, 32 cal., \$3.50.....2 1/2
Primed Shells and Bullets.....15@2 1/2
B. B. Caps, Round Ball, \$1.75.....2 1/2
B. B. Caps, Con. Ball, Swgd., \$2.00.....2 1/2

Primers—

Berdan Primers, \$1.00.....2 1/2
B. L. Caps (for Sturtevant Shells) \$1.00.....2 1/2
All other Primers, \$1.30.....2 1/2

Shells—

First quality 4, 8, 10 and 12 gauge.....25@10 1/2
First quality, 14, 16 and 20 gauge (\$10 list).....30@10 1/2
Prise.....40@2 1/2
Star, Club, Rival and Climax brands.....33 1/2@10 1/2
Selbold's Comb. Shot Shells.....15@2 1/2
Brass Shot Shells, 1st quality.....60@2 1/2
Brass Shot Shells, Club, Rival, Climax.....65@2 1/2

Shells Loaded—

Standard List, July 19, 1890.....40@5 1/2
Wads—Price per M.
U. M. C. & W. R. A.—B. E., 11 up.....68 1/2
U. M. C. & W. R. A.—B. E., 9@10.....82 1/2
U. M. C. & W. R. A.—B. E., 8.....96 1/2
U. M. C. & W. R. A.—B. E., 7.....\$1.10
U. M. C. & W. R. A.—P. E., 9@10.....1.50
U. M. C. & W. R. A.—P. E., 8.....1.70
U. M. C. & W. R. A.—P. E., 7.....1.80
Eley's R. E., 11 up.....\$1.75
Eley's P. E., 11@20.....2.80

Anvils—

Eagle Anvil, 100 lb.....15@15 1/2
Peter Wright's.....11 1/2@12 1/2
Armstrong's Mouse Hole.....10 1/2@11 1/2
Armstrong's Mouse Hole, Extra.....12 1/2@13 1/2
Trenton.....10@10 1/2
Wilkinson's.....10 1/2@11 1/2
Moore & Barnes Mfg. Co.....33 1/2
Anvil Vice and Drill—
Mellers Falls Co., \$18.00.....20 1/2
Cheney Anvil and Vice.....25 1/2
Allen Anvil and Vice, \$3.00.....40@10 1/2
Star.....45@5 1/2

Apple Parers—See Parers, Apple, &c.

Augers and Bits—

Douglas Mfg. Co.....70@10 1/2
Wm. A. Ives & Co.....70@10 1/2
Humphreysville Mfg. Co.....70@10 1/2
French, Swift & Co. (P. H. Beecher).....70@10 1/2
P. S. & W. Co.....70@10 1/2
Rockford Bit Company.....70@10 1/2
Cook's, Douglas Mfg. Co.....65 1/2
Cook's, N. H. Copper Co. 50@10@60@10 1/2
Ives' Circular Lip.....60 1/2
Patent Solid Head.....30 1/2
C. E. Jennings & Co., No. 10, extension.....40 1/2
C. E. Jennings & Co., No. 30.....40 1/2
C. E. Jennings & Co., Auger Bits, set, 32 1/2 quaters, No. 5, 35; No. 30, \$3.50.....45 1/2
Lewis' Patent Single Twist.....45 1/2
Russell Jennings' Augers and Bits 25@10 1/2
Imitation Jennings' Bits.....60@60 1/2
Snell's Jennings Pattern.....60 1/2
Pugh's Black.....20 1/2
Rockford, Jennings' Pattern.....60 1/2
Car Bits, P. S. & W. Co.....60@60 1/2
Snell's Car Bits.....60 1/2
L. Hommedieu Car Bits.....15@10 1/2
Forster's Pat. Auger Bits.....20 1/2
Cincinnati Bell-Hangers' Bits.....30@10 1/2

Bit Stock Drills—

Morse Twist Drills.....50@10 1/2
Standard.....50@10 1/2
Cleveland.....50@10 1/2
Syracuse, for metal.....50@10 1/2
Williams' or Holt's, for metal 50@10 1/2
Williams' or Holt's, for wood.....40@10 1/2
Cincinnati, for wood.....30@10 1/2
Cincinnati, for metal.....45@10 1/2

Expansive Bits—

Clark's small, \$18; large, \$26 1/2.....35@35 1/2
Ives' No. 4, \$ dos 60.....40 1/2
Swan's.....40 1/2
Stearns' No. 1, \$26; No. 2, \$22.....35 1/2
Stearns' No. 3, \$45.....20 1/2

Gimlet Bits—

Common.....\$ gross \$2.75@23.25
Diamond.....\$ dos \$1.10.....25@10 1/2
See.....25@25 1/2
Double Cut, Shephardson's.....45@45 1/2

Double Cut, Ct. Valley Mfg. Co.....30@10 1/2
Double Cut, Hartwell's, \$ gro.....\$5.25
Double Cut, Douglass.....40@10 1/2
Double Cut, Ives.....60@60 1/2

Hollow Augers—

Ives.....33 1/2@
French, Swift & Co.....33 1/2@10 1/2
Douglas.....40@10 1/2
Bonney's Adjustable, \$ dos 48.....40@10 1/2
Stearns'.....20@10 1/2
Ives' Expansive, each \$4.50.....50@5 1/2
Universal Expansive, each \$4.50.....20 1/2
Wood's.....25@25 1/2
Cincinnati Adjustable.....25@10 1/2
Cincinnati Standard.....25@10 1/2

Ship Augers and Bits—

L'Hommedieu's.....15@10@15@10 1/2
Watrous'.....15@10@15@10 1/2
Snell's.....15@10@15@10 1/2
Snell's Ship Auger Pat'n Car Bits.....15@10@15@10 1/2

Awl Hafts—See Hafts, Awl.

Awls, Brad Sets, &c—
Awls, Sewing, Common \$ gr \$1.70, 35 1/2
Awls, Should. Peg, \$ gr \$2.45, 40@40 1/2
Awls, Pat. Peg, \$ gr 63 1/2.....40@40 1/2
Awls, Shouldered Brad, \$ gr.....55 1/2
Awls, Handled Brad, \$ gr.....45 1/2
Awls, Handled Scratch, \$ gr, \$7.50, 35@10 1/2
Awls, Socket Scratch, \$ dos, \$1.50, 25@30 1/2

Awl and Tool Sets—See Sets, Awl and Tool.

Axes— Plain, Beveled.
First quality.....\$8.00, \$5.50
Others.....7.50, 8.00

Axle Greases—See Grease, Axle.

Axles—
No. 1, 1 1/2, 2, 2 1/2, 3, 3 1/2, 4, 4 1/2, 5, 5 1/2, 6, 6 1/2, 7, 7 1/2, 8, 8 1/2, 9, 9 1/2, 10, 10 1/2, 11, 11 1/2, 12, 12 1/2, 13, 13 1/2, 14, 14 1/2, 15, 15 1/2, 16, 16 1/2, 17, 17 1/2, 18, 18 1/2, 19, 19 1/2, 20, 20 1/2, 21, 21 1/2, 22, 22 1/2, 23, 23 1/2, 24, 24 1/2, 25, 25 1/2, 26, 26 1/2, 27, 27 1/2, 28, 28 1/2, 29, 29 1/2, 30, 30 1/2, 31, 31 1/2, 32, 32 1/2, 33, 33 1/2, 34, 34 1/2, 35, 35 1/2, 36, 36 1/2, 37, 37 1/2, 38, 38 1/2, 39, 39 1/2, 40, 40 1/2, 41, 41 1/2, 42, 42 1/2, 43, 43 1/2, 44, 44 1/2, 45, 45 1/2, 46, 46 1/2, 47, 47 1/2, 48, 48 1/2, 49, 49 1/2, 50, 50 1/2, 51, 51 1/2, 52, 52 1/2, 53, 53 1/2, 54, 54 1/2, 55, 55 1/2, 56, 56 1/2, 57, 57 1/2, 58, 58 1/2, 59, 59 1/2, 60, 60 1/2, 61, 61 1/2, 62, 62 1/2, 63, 63 1/2, 64, 64 1/2, 65, 65 1/2, 66, 66 1/2, 67, 67 1/2, 68, 68 1/2, 69, 69 1/2, 70, 70 1/2, 71, 71 1/2, 72, 72 1/2, 73, 73 1/2, 74, 74 1/2, 75, 75 1/2, 76, 76 1/2, 77, 77 1/2, 78, 78 1/2, 79, 79 1/2, 80, 80 1/2, 81, 81 1/2, 82, 82 1/2, 83, 83 1/2, 84, 84 1/2, 85, 85 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587, 587 1/2, 588, 588 1/2, 589, 589 1/2, 590, 590 1/2, 591, 591 1/2, 592, 592 1/2,

Chucks—

Bench Pat.	each, \$8.00	20%
Morse's Adjustable	each, \$7.00	20@20.5%
Danbury	each, \$6.00	30@30.5%
Syracuse, Bala Pat.		25%
Graham Patent		33.5%
Skinner's Patent Chucks		33.5%
Combination Lathe Chucks		33.5%
Universal Lathe Chucks		40%
Independent Lathe Chucks		40%
Drill Chucks		45%
Union Mfg. Co.		
Victor	\$8.50	25%
Combination		40%
Universal		40%
Independent		40%

Churns.

Tiffin Union, each, 5 gal.	\$3.25; 7 gal., \$3.75; 10 gal., \$4.25.
McDonald Star Barrel Churn, each,	6 gal., \$2.60; 10 gal., \$2.75; 15 gal., \$3.00; 20 gal., \$3.25.

Clamps—

R. I. Tool Co.'s Wrought Iron	25%
Adjustable, Cincinnati	15@10%
Adjustable, Hammers	15%
Adjustable, Stearns	30@30.5%
Stearns' Adjustable Cabinet and Corner	30@30.5%
Cabinet, Sargent's	60@10%
Carriage Makers', Sargent's	70@10%
Carriage Makers', P. S. & W. Co.	40@10%
Riverboro Mfg. Co.	40@5@40.5%
Warner's	40@10@40.5%
Saw Clamps, saw Vices, Saw Filers	
Carpenters', Cincinnati	25@10%

Cleavers.

Butchers.	
Bradley's	25@30%
L. & J. White	20@5%
Bentley's	40@40.5%
New Haven Edge Tool Co.	40%
P. S. & W.	30@30.5%
Foster Bros.	30%
Schulte, Lohoff & Co.	40@40.5%

Clips—

Norway, Axle, 1/4 & 5-16	55@55.5%
2nd grade Norway Axle, 1/4 & 5-16	65@55.5%
Superior Axle Clips	60@55.5%
Norway Spring Bar Clips, 5-16	60@55.5%
Wrought-Iron Felloe Clips	50@55.5%
Steel Felloe Clips	50@55.5%
Baker Axle Clips	50%

Cloth and Netting, Wire—See Wire, &c.**Cockeys.**

Cocks, Brass.	
Hardware list	50@2%

Coffee Mills—See Mills, Coffee.**Collars, Dog, &c.**

Medford Fancy Goods Co.	40@10%
Embossed, Gilt, Pope & Steven's list	30@10%
Leather, Pope & Steven's list	40%
Brass, Pope & Steven's list	40%
Chapman Mfg. Company	50@10@60%

Combs, Curry.

Fitch's	60@10@50@10@10%
Rubber, per doz	\$10.00
Perfect	50%

Compasses, Dividers, &c.—

Compasses, Calipers, Dividers	70@70.5%
Bemis & Call Co.'s	
Dividers	60@5%
Compasses & Calipers	50@5%
Wing and Inside or Outside	50@5%
Double	60%
(Call's Pat. Inside)	30%
Excelsior	50%
J. Stevens & Co.'s	25@10%
Blairrett's	
Spring Calipers and Dividers	25@10%
Lock Calipers and Dividers	25%
Combination Dividers	25%

Coopers' Tools—See Tools, Coopers'.**Cord—**

Sash.	
Common	10@11%
Patent, good quality	13@13.5%
White Cotton Braided, fair	26@27%
Common Russia Sash	13%
Patent	15%
Cable Laid Italian Sash	22@23%
Indian Cable Laid	13%
Silver Lake—	
A Quality, White, 50¢	10@10.5%
A Quality, Drab, 55¢	10@10.5%
B Quality, White, 50¢	28@30%
B Quality, Drab, 55¢	31@33%
C Quality, White only	26@27%
Sylvan Spring, Extra Braided, White, 34¢	
Sylvan Spring, Extra Braided, Drab, 30¢	
Semper Idem, Braided, White	30%
Egyptian, India Hemp, Braided	25%
Samson—	
Braided, White Cotton, 50¢	30@30.5%
Braided, Drab Cotton, 55¢	30@30.5%
Braided, Italian Hemp, 55¢	30@30.5%
Braided, Linen, 80¢	30@30.5%
Tate & Co. Braided Wire, 100 ft.	54¢
Wire Picture	
Braided or Twisted	75@10%

Corkscrews—See Screws, Cork.**Corn Knives and Cutters—See Knives, Corn.****Crackers, Nut—**

Table (H. & B. Mfg. Co.)	40%
Blake's Pattern	20@20.10%
Turner & Seymour Mfg. Co.	50%

Cradles—

Grain	50@52@50@10@2%
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Crayons.

White Crayons, 1/2 gr, 12¢@12.5¢	10%
D. M. Stewart Mfg. Co., Metal Work—	
ers, 1/2 gr, \$2.50	25%
D. M. Stewart Mfg. Co., Rolling Mill	
1/2 gr, \$2.50	25%
See also Chalk.	

Crow Bars—See Bars, Crow.**Curry Combs—See Combs, Curry.****Curtain Pins—See Pins, Curtain.****Cutters—**

Meat.	
Dixon's #2 doz.	40@25%
Nos. 1 2 3 4	
\$14.00 \$17.00 \$19.00 \$20.00	

Woodruff's #2 doz.

Nos.	100 150
\$15.00 \$18.00	

Hales Pattern #2 doz.

Nos.	11 12 13
\$27.00 \$33.00 \$45.00	

American.

Nos.	1 2 3 4 5 6
\$5 \$7 \$10 \$25 \$50 \$60	

Enterprise.

Nos.	10 12 22 32 42
\$3 \$2.50 \$4 \$6 \$16	

Great American Meat Cutter.

Nos.	112 116 118 120 122
\$2.00 \$2.75 \$3.00 \$2.50 \$4.00	

Miles' Challenge #2 doz.

Nos.	1 2 3
\$22.00 \$30.00 \$40.00	

Home No. 1.

#2 doz.	\$26.00, 55@10%
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Draw Cut, each.

Nos.	5 6 8
\$50 \$75 \$90 \$225	20@25%

Great American.

Beef Shavers (Enterprise)	30@10@30%
Little Giant	50%
Chadborn's Smoked Beef Cutter, #2 doz	\$60.00

Tobacco.

Champion	20@10@30%
Wood Bottom	\$2.00@5.25
All Iron	\$2.25
Nashua Lock Co.'s, #2 doz	\$18.00 50@55%
Wilson's	50%
Sargent's	\$2.50 55@10%
Acme	\$2.00 40%

Smith's Pat.

#2 doz	\$12.00, 20@10@10%
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Johnson's.

#2 doz	\$11.00, 33@%
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Penny's #2 doz Pol.

#14; Jap'd	\$16.00, 55%
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Appleton's.

#2 doz	\$16.00, 60@10%
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Bonney's.

#2 doz	\$16.00, 30@10%
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Cincinnati.

#2 doz	\$16.00, 25@10%
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Cutlery—

Pocket and Table	Net prices
Wostenholm	New list in preparation

Dampers, &c.—

Dampers, Buffalo	40@10%
Buffalo Damper Clips	40@10%
Crown Damper	40%
Excelsior	40@10%

Diggers, Post Hole, &c.—

Samson Post Hole Digger, #2 doz	\$36.00, 25%
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Fletcher Post Hole Augers.

#2 doz	\$36.00, 20%
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Eureka Diggers.

#2 doz	\$12.50@14.00
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Leel's.

#2 doz	\$8.00@9.00
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Vaughan's Post Hole Auger.

#2 doz	\$13.00@14.00
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Kohler's Little Giant.

#2 doz	\$18.00
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Kohler's Hercules.

#2 doz	\$15.00
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Kohler's New Champion.

#2 doz	\$9.00
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Schneider.

#2 doz	\$18.00
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Ryan's Post Hole Diggers.

#2 doz	\$24.00
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Crunk's Post Bars.

#2 doz	\$60.00, 50%
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Gibbs Post Hole Digger.

#2 doz	\$30.00, 50%
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Imperial.

#2 doz	\$15.00, 45%
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Dividers—

See Compasses.	
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Dog Collars—See Collars, Dog, &c.**Door Springs—See Springs, Door.****Drawers.**

Money, #2 doz.	\$18@20
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Drawing Knives—See Knives, Drawing.**Drills and Drill Stocks—**

Blacksmith's	each \$1.75
Blacksmith's Self Feeding, each	\$7.50, 25%
Breast, P. S. & W.	40@10%
Breast, Wilson's	30@5%
Breast, Miller's Falls	each \$3.00, 25%
Breast, Bartholomew's	each \$2.50, 25%
Ratchet, Merrill's	20@20.5%
Ratchet, Ingersoll's	20@20.5%
Ratchet, Parker's	20@20.5%
Ratchet, Whitney's	20@10%
Ratchet, Weston's	20@25%
Ratchet, Moore's Triple Action	25@30%
Ratchet, Curtis & Curtis	30%
Whitney's Hand Drill, Plain	\$11.00
Adjustable	\$12.00
Wilson's Drill Stocks	10%
Automatic Boring Tools	\$1.75@1.85
Morse	50@10@5%
Standard	50@10@5%
Syracuse Metal Hat	50@10%
Cleveland	50@10@5%
Williams	50@10@5%
New Process	50@10@5%
Graham's Pat. Groove Shank	50@10@5%

Drill Bits—See Augers and Bits.**Drill Chucks—See Chucks.****Dripping Pans—See Pans, Dripping.****Drivers, Screw.**

Douglas Mfg. Co.	20@20.10%
Disston's	50%
Buck Bros.	30%
Stanley R. & L. Co.'s	
Varnished Handles	65@10%
Black Handles	60@10%
Sargent & Co.'s	
No. 1 Forged Blade	60@10@10%
Nos. 20, 30 and 60	60@10@10%
P. S. & W.	70%
Knapp & Cowles	
No. 1	60@20@70%
No. 2	60@10@10%
No. 3	60@5@10%
Nos. 4 and 60, Acme and Ideal	50%
50@50@10@5%	
Stearns	25@10@5%
Gay & Parsons	35%
Champion	25@10%
Clark's Pat.	30@35%
Crawford's	30%
Ellrich's Socket and Ratchet	25@30%
Allard's Spiral, new list	25%
Kolb's Common Sense #2 doz	\$0.25@10%
Syracuse Screw-Drivers	30@30.5%
Screw-Drivers Bits	#2 doz, 50@75%

Screw-Drivers Bits, Parr's.

#2 doz	\$6.25
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Fray's Hol. Hdie. Sets.

No. 3	\$12.00, 25@25.10%
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P. D. & Co.'s all Steel.

Cincinnati	25@10%
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Brace Screw Drivers.

Buck Bros.	25@10%
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Egg Beaters.—See Beaters, Egg.**Egg Pochers.—See Pochers, Egg.****Electric Bell Sets.—See Bells, Electric.****Emery.—No. 4 to No. 54 to Flour, CF.**

46 gr.	150 gr.	F. FF.
1/2 kegs, #2	5¢	2 1/2¢
1/2 kegs, #3	4 1/2¢	2 1/2¢
1/2 kegs, #4	5¢	3¢
10-lb cans, 10	6¢	5¢
10-lb cans, less than 10	10¢	7 1/2¢

Enameled and Tinned Ware—See Ware, Hollow.**Escutcheon Pins—See Pins, Escutcheon.****Escutcheons.**

Door Lock	Same dis as Door Locks.
Brass Thread	.60@60.10%
Wood	25%

Expanded Metal.

List No. 5.	
Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	25%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Fasteners, Blind—

Mackrell's, #2 doz.	\$1.00, 20@20.10%
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Van Sand's Screw Pat.

#15 # gr.	60@10%
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Van Sand's Old Pat.

#15 # gr.	55@10%
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Washburn's Old Pattern.

# gr.	\$9.00
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Merriman's.

new list	
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Austin & Eddy No. 2008 # gr.

# gr.	\$9.00
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Security Gravity, # gr.

# gr.	\$9.00
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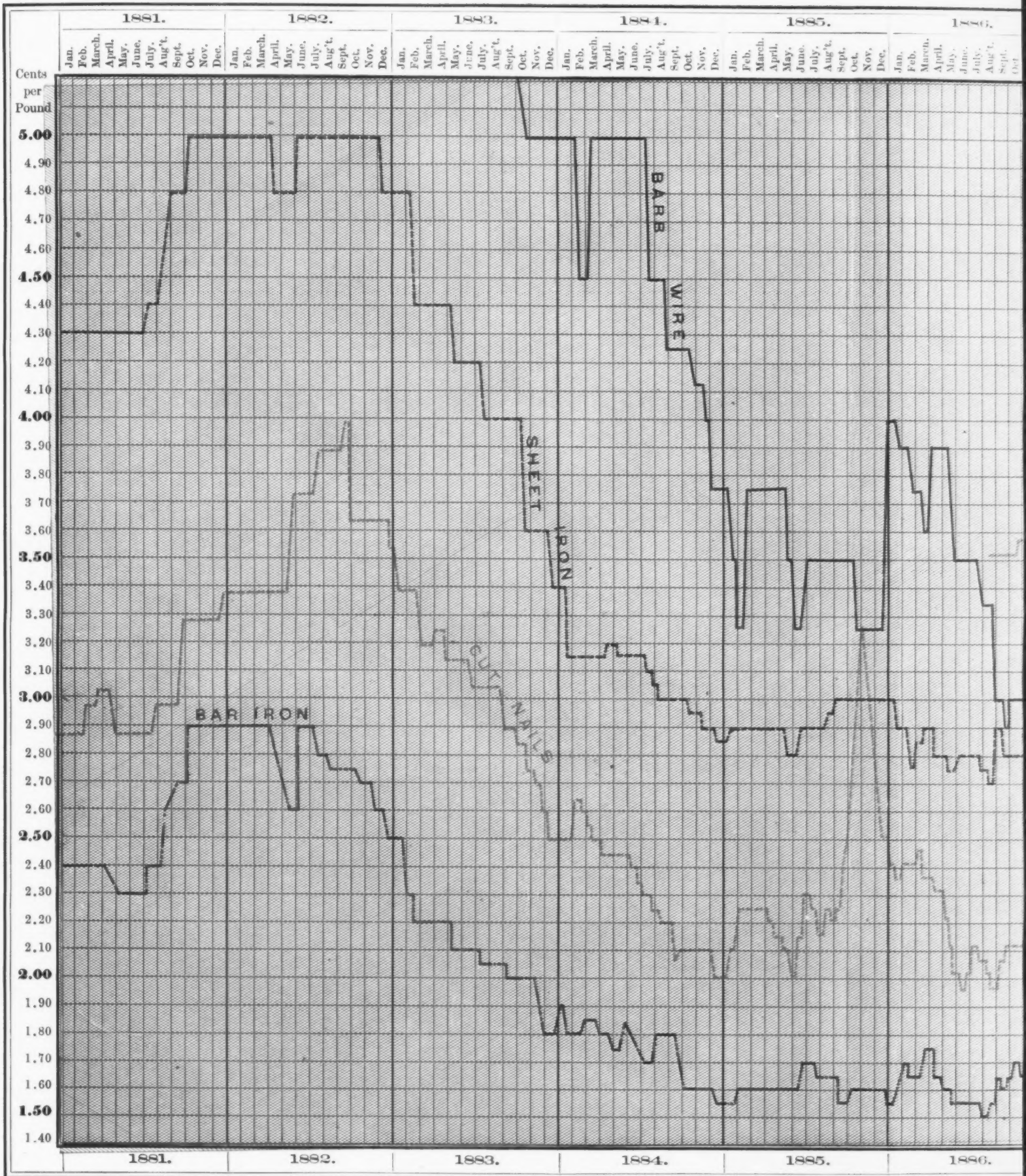
Faucets.—

Frary's Pat. Petroleum.....	40&5&2%
B. & L. B. Co.	

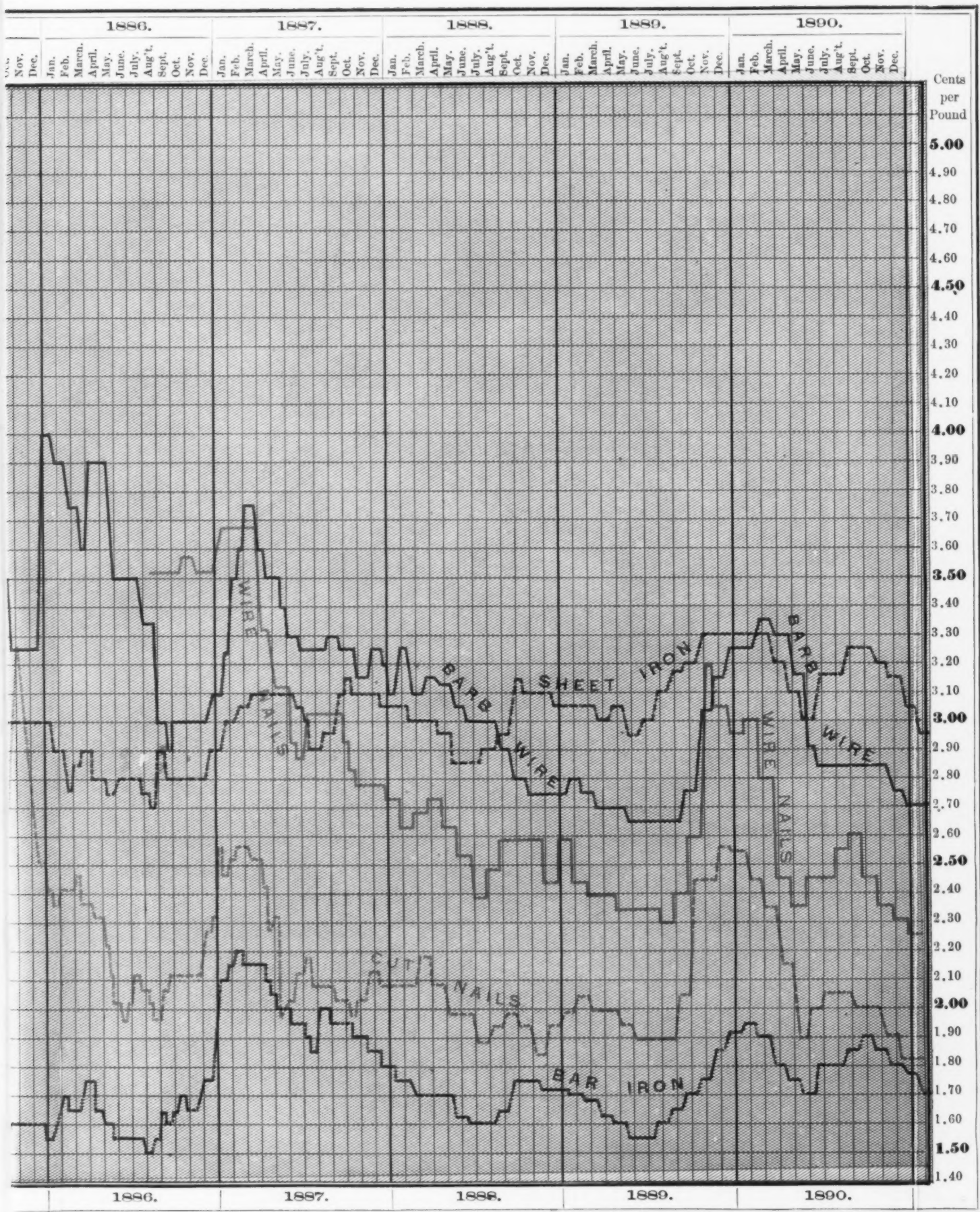
Atkins' Circular Shingle and Heading dis 50%	Hammer, Hotchkiss.....\$5.50, 10%	Smith's Adjustable Milk Strainer. \$ dos \$2.00	Fence Staples, Galvanized. (Same price as B'n Wire. Fence Staples, Plain.) See Trd. Rep.
Atkins' Silver Steel Diamond X Cuts foot 70%	Bemis & Call Co.'s Lever and Spring Hammer.....30c	Smith's Adjustable T. & C. Strainer. \$ dos \$1.25	Steelyards.....40c to \$5.00
Atkins' Special Steel Dexter X Cuts foot 50%	Bemis & Call Co.'s Plate.....10%	Stoves, Wooden Rim— Iron. Plated.	Stocks and Dies—
Atkins' Special Steel Diamond X Cuts foot 32%	Bemis & Call Co.'s Cross Cut.....12%	Mesh 18, Nested, \$ dos.. 80c \$1.00	Blacksmith's
Atkins' Champion and Electric Tooth X Cuts.....foot 30%	Alken's Genuine.....\$13.00, 50c to 10c	Mesh 20, Nested, \$ dos.. 95c 1.10	Waterford Goods.....40c to \$5.00
Atkins' Hollow Back X Cuts.....foot 20%	Alken's Imitation.....\$7.00, 50c to 10c	Mesh 24, Nested, \$ dos.. \$1.15 1.25	Butterfield's Goods.....40c to \$5.00
Atkins' Mulay Mill and Drag.....40%	Hart's Pat. Lever.....25c		Lighting Screw Plate.....25c to 30c
Atkins' One-Man Saw, with handles, foot 40%	Diaston's Star.....25c		Reece's New Screw Plates.....33c to \$5.00
Peace Circular and Mill.....45%	Leopold.....40c to \$5.00		Reversible Ratchet.....30c
Peace Hand Panel and Rip.....25%	Atkin's Lever.....\$ dos No. 1, \$6.00		Gardner.....25c
Peace Cross Cuts.....45%	Atkin's Criterion.....\$ dos No. 1, \$6.00		
Richardson's Circular and Mill.....45%	Croissant (Keller), No. 1, \$15.00; No. 2, \$24.00.....40c to 10c		
Richardson's X Cuts.....25%	Avery's Saw Set and Punch.....50%		
C. E. Jennings & Co., Hand, Panel and Rip.....25%	Chieftain H. R. Co.'s Superior..... \$ dos \$15, 50%		
Griffin's complete.....40c to \$5.00	Sharpeners, Knife.		
Griffin's Back Saw, Blades.....40c to \$5.00	Parkins.		
Star Back Saws and Blades.....25%	Applewood Handles.....\$ dos \$6.00, 40%		
Eureka and Crescent.....25%	Rosewood or Cocobolo.....\$ dos \$9.00, 40%		
Scroll—	Shaves, Spoke.		
Lester, complete, \$10.00.....25%	Iron.....45%		
Rogers, complete, \$4.00.....25%	Wood.....30%		
Barnes' Builders' and Cabinet Makers', \$15.....25%	Bailey's (Stanley R. & L. Co.).....40c to 10c		
Barnes' Scroll Saw Blades.....35%	Stearns.....25c to 10c		
Saw Frames—See Frames, Saw.	Cincinnati.....25c to 10c		
Saw Sets—See Sets, Saw.	Shears—		
Saw Tools—See Tools, Saw.	American (Cast) Iron.....75c to \$1.00		
Scales—	Barnard's Lamp Trimmers.....\$ dos \$3.75		
Hatch, Counter, No. 171, good quality, \$ dos \$21.00	Tinners', List, Dec. 1881.....20c to 25%		
Hatch, Tea, No. 161.....\$ dos \$6.75 to \$7.00	Seymour's, List, Dec. 1881.....60c to \$1.00		
Union Platform, Plain.....\$2.10 to \$2.50	Heinisch's, List, Dec. 1881.....60c to \$1.00		
Union Platform, Striped.....\$2.30 to \$2.50	Heinisch's Tailor's Shears.....35c to 50%		
Chattillon's Grocers' Trip Scales.....50%	First quality C. S. Trimmers.....30c to 40%		
Chattillon's Eureka.....25%	Second quality C. S. Trimmers.....80c to \$1.00		
Chattillon's Favorite.....40%	Acme Cast Shears.....10c to 10c		
Family, Turnbills.....30c to \$1.00	Union Platform Cast Shears.....10c		
Riehle Bros.' Platform.....40%	Clipper.....10c to 10c		
Scale Beams—See Beams, Scale	Victor Cast Shears.....75c to \$1.00		
Scissors, Fluting.....45%	Howe Bros. & Hubert, Solid Forged Steel.....40%		
Scrapers—	Chicago Drop Forge & F. Co., Solid Steel Forged.....60%		
Adjustable Box Scraper (S. R. & L. Co.) \$0.50.....30c to 10c	Clausen Shear Co., Japanned.....70%		
Box, 1 Handle.....\$ dos \$4.00, 10c	Clausen Shear Co., Nickel, same list.....60%		
Box, 2 Handle.....\$ dos \$4.00, 10c	Galvanic, 3/4 to 9 in, \$ dos, \$1.00 \$1.50		
Defiance Box and Ship.....20c to 10c	Pruning Shears and Hooks.		
Foot.....50c to \$1.00	Diaston's Combined Pruning Hook and Saw.....\$ dos \$18.00, 20c to 10c		
Ship, Common.....\$ dos \$3.50 net	Diaston's Pruning Hook, \$ dos \$12.00		
Ship, R. I. Tool Co.....10%	E. S. Lee & Co.'s Pruning Tools.....40%		
Screen Window and Door	Pruning Shears, Henry's Pat. \$ dos \$3.75 to \$4.00		
Frames—See Frames.	Henry's Pruning Shears, \$ dos \$4.25 to 4.50		
Screw Drivers—See Drivers, Screw.	Wheeler, M. & C. Co.'s Combination, \$ dos \$12.00, 20%		
Screws.	Dunlap's Saw and Chisel, \$ dos \$8.50, 30%		
Bench and Hand—	J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25 P. S. & W. Co.....60%		
Bench, Iron.....55c to \$1.00	Tinners', etc.—		
Bench, Wood, Beech.....\$ dos \$2.25	Shears and Snips (P. S. & W.).....20c to 25%		
Bench, Wood, Hickory.....20c to 10c	Snips, J. Mallinson & Co.....35c to 40%		
Lag, Blunt Point, list Jan. 1, 1890, 75c to 10c	Sheaves—		
Coach and Lag, Glimet Point, list Jan. 1, 1890.....75c to 10c	Sliding Door—		
Bed.....25c to 50%	M. W. Co., list July, 1888, 50c to \$1.00		
Hand Nail, Sargent's.....60c to 10c	R. & E., list Dec. 18, 1885.....55c to 20%		
Hand Nail, H. & B. Mfg. Co., 70c to \$1.00	Corbin's list.....60c to 10c		
Hand Nail, Am. Screw Co., 75c	Patent Roller.....60c to 10c		
Jack Screws, Millers Falls list.....60c to 50%	Patent Roller, Hatfield's.....75c		
Jack Screws, P. S. & W.....35%	Russell's Anti-Friction, list Dec. 18, 1885.....60c to 25%		
Jack Screws Sargent.....40c to \$1.00	Moore's Anti-Friction.....50%		
Jack Screws Stearns.....40c to \$1.00	Sliding Shutter—		
Cork—	R. & E. list Dec. 18, 1885.....60c to 10c		
Humason & Beeley Mfg. Co., 40c to \$1.00	Sargent's list.....60c to 10c		
Williamson's.....35c to 30%	Reading list.....60c to \$1.00		
Howe Bros. & Hubert.....35%	Ship Tools—		
Machine—	L. & J. J. White.....20c to 50%		
Flat Head, Iron.....55%	Shoes, Horse, Mule, &c.—		
Round Head, Iron.....50%	Horse—		
Wood—	Burden's, Perkins', Phoenix, at factory. \$4.00		
List January 1, 1891.	Mule—		
Flat Head Iron.....72c to 10c	Add \$1 \$ keg to above prices.		
Round Head Iron.....67c to 10c	Oz. Wrought—		
Flat Head Brass.....65c to 10c	Ton lots.....\$ dos 9c		
Round Head Brass.....65c to 10c	1000 lb lots.....\$ dos 9c		
Flat Head Bronze.....72c to 10c	500 lb lots.....\$ dos 10c		
Round Head Bronze.....65c to 10c	Shot—		
Rogers' Drive Screws.....83c to 10c	Drop, up to BB, 25-lb bag, \$1.32		
Scroll Saws—See Saws, Scroll.	Drop, up to BB, 5-lb bag.....35c		
Scythes.	Drop, BB and larger, 25-lb bag.....1.57		
Grass.....4c to 5c	Drop, BB and larger, 5-lb bag......40		
Grass.....40c to \$5.00	Buck and Chilled, 25-lb bag 1.57		
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Axis and Tool.	Dust Shot, 5-lb bag......45		
Alken's Sets, Awns and Tools, No. 20, \$ dos \$10.00.....65c to 10c	Shovels and Spades—		
Pray's Adj. Tool Hds., Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$9.....25c to 10c	Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20c		
Miller's Falls Adj. Tool Hds., Nos. 1, \$12; 2, \$18.....25%	Norw.—Jobbers frequently give 5c to 7c extra on above.		
Henry's Combination Haft.....\$ dos \$6.50	Griffith's Black Iron.....50c to 10c		
Brad Sets, No. 42, \$10.50; No. 43, \$12.50, 70c to \$1.00	Griffith's C. S.....60c to \$1.00		
Stanley's Excelsior, No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50.....30c to 10c	Griffith's Solid C. S. R. Goods.....20%		
Nail—	St. Louis Shovel Co.....20c to 20c		
Square.....\$ gr. \$4.00 to \$4.25	Hussey, Binns & Co.....15c to 25%		
Round.....\$ gr. \$3.25	Hubbard & Co.....20c to 20c		
Buck Bros.....27c to 10c	Lehigh Mfg. Co.....50c to 10c		
Cannon's Diamond Point.....\$ gr. \$12, 20%	H. M. Myers Co.....30c		
Rivet.	Payne Petterbone & Son.....33c to 45%		
Regular list.....50c to 10c	Remington's (Lowman's Pat.) \$ dos \$2.50		
Saw—	Rowland's, Black Iron.....50c to 10c		
Stillman's Genuine.....\$ dos \$5.00 to \$7.75	Rowland's Steel.....60c to \$1.00		
Stillman's Imita.....\$ dos \$3.25 to \$5.25	Shovels and Tongs—		
Common Lever.....\$ dos \$2.00, 40c to 50%	Iron Head.....60c to \$1.00		
Morrill's No. 1, \$15.00; Nos. 3 & 4, \$24.00	Brass Head.....60c to \$1.00		
Leach's, No. 0, \$9.99; No. 1, \$15, 15c to 20%	Sieves—		
ash's.....80c to \$1.00	Mann's Tin Rim.....50c to 25%		
	Buffalo Metallic, S. S. & Co.....50c to 25%		
	Shaker (Barier's Pat.) Flour Sifters..... \$ dos \$2.00; \$ gr \$21.00		
	Electric.....\$ dos \$2.00		
	Smith's Adjustable Sifters.....\$ dos \$2.00		

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No. 204, 1/4 and 1/2 B. Balls.....	204
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No. 228, 1/4 and 1/2 B. Balls.....	204
No. 234, 1/4 and 1/2 B. Balls.....	204
No. 240, 1/4 and 1/2 B. Balls.....	204
No. 246, 1/4 and 1/2 B. Balls.....	204
No. 252, 1/4 and 1/2 B. Balls.....	204
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No. 300, 1/4 and 1/2 B. Balls.....	204
No. 306, 1/4 and 1/2 B. Balls.....	204
No. 312, 1/4 and 1/2 B. Balls.....	204
No. 318, 1/4 and 1/2 B. Balls.....	204
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No. 372, 1/4 and 1/2 B. Balls.....	204
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No. 384, 1/4 and 1/2 B. Balls.....	204
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No. 1134, 1/4 and 1/2 B. Balls.....	204
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CHICAGO PRICES OF
 BAR IRON, SHEET IRON, CUT NAILS, WIRE
 COMPILED FROM THE CHICAGO MARKET REPORTS



GO PRICES OF NAILS, WIRE NAILS AND BARB WIRE.

GO MARKET REPORTS OF THE IRON AGE.

